US012186251B2

(12) **United States Patent**
Watkins

(10) **Patent No.: US 12,186,251 B2**
(45) **Date of Patent: Jan. 7, 2025**

(54) **HEAD AND NECK CRADLE**

(71) Applicant: **Joshua Michael Watkins**, Woodstock, GA (US)

(72) Inventor: **Joshua Michael Watkins**, Woodstock, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 303 days.

(21) Appl. No.: **17/864,392**

(22) Filed: **Jul. 13, 2022**

(65) **Prior Publication Data**

US 2023/0016803 A1 Jan. 19, 2023

Related U.S. Application Data

(60) Provisional application No. 63/221,458, filed on Jul. 13, 2021.

(51) **Int. Cl.**
A61G 7/05 (2006.01)
A61G 7/07 (2006.01)

(52) **U.S. Cl.**
CPC ***A61G 7/072*** (2013.01)

(58) **Field of Classification Search**
CPC . A61G 7/00; A61G 7/05; A61G 7/065; A61G 7/072
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

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8,370,976 B2 * 2/2013 Matt A47C 20/026 5/643

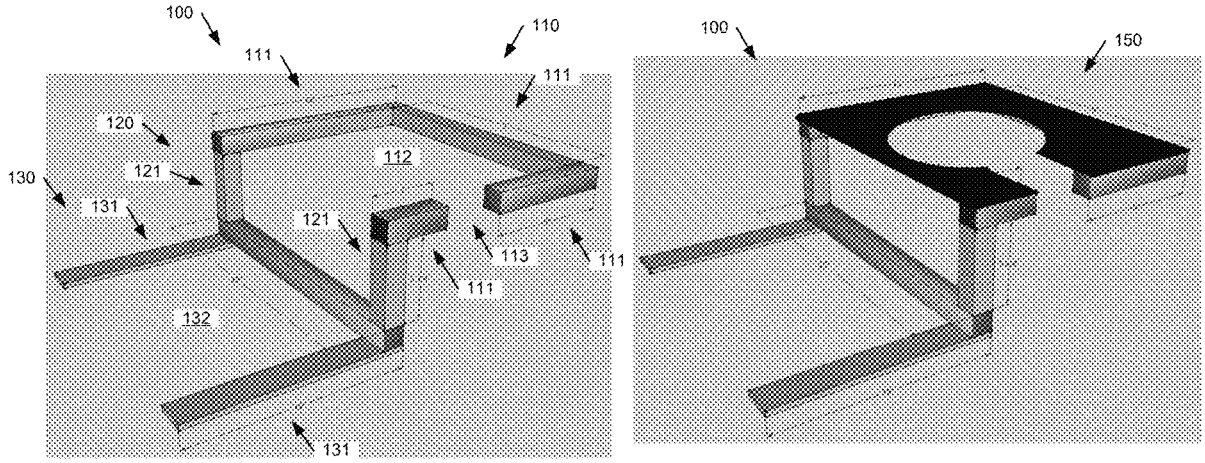
* cited by examiner

Primary Examiner — Fredrick C Conley
(74) *Attorney, Agent, or Firm* — Incorporating Innovation LLC; Charlena Thorpe, Esq.

(57) **ABSTRACT**

Implementations of a head and neck cradle comprise an upper platform, a middle platform (or middle portion), and a lower platform. In some implementations, a method of using the head and neck cradle comprises placing the lower platform under a hospital bed mattress such that the upper platform rests adjacent to the end of the mattress and extends away from the hospital bed, and may further comprise placing a patient in a prone position on the hospital bed mattress with the patient's head placed on the upper platform.

9 Claims, 36 Drawing Sheets



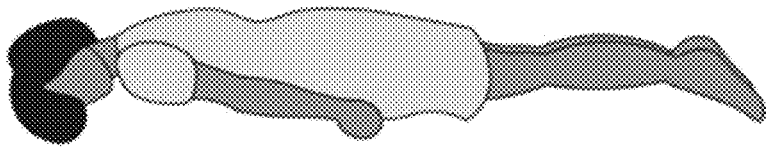


FIG. 1A
(PRIOR ART)

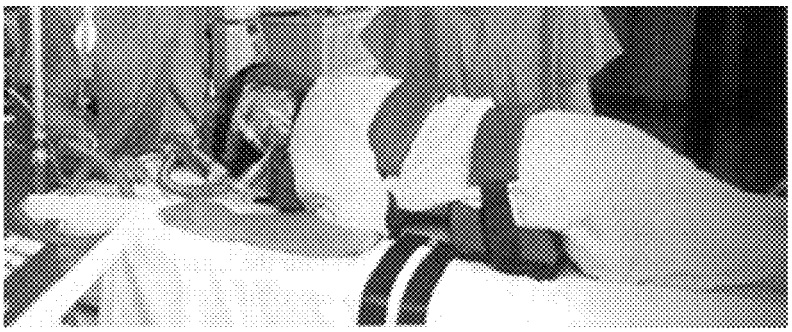


FIG. 1B
(PRIOR ART)

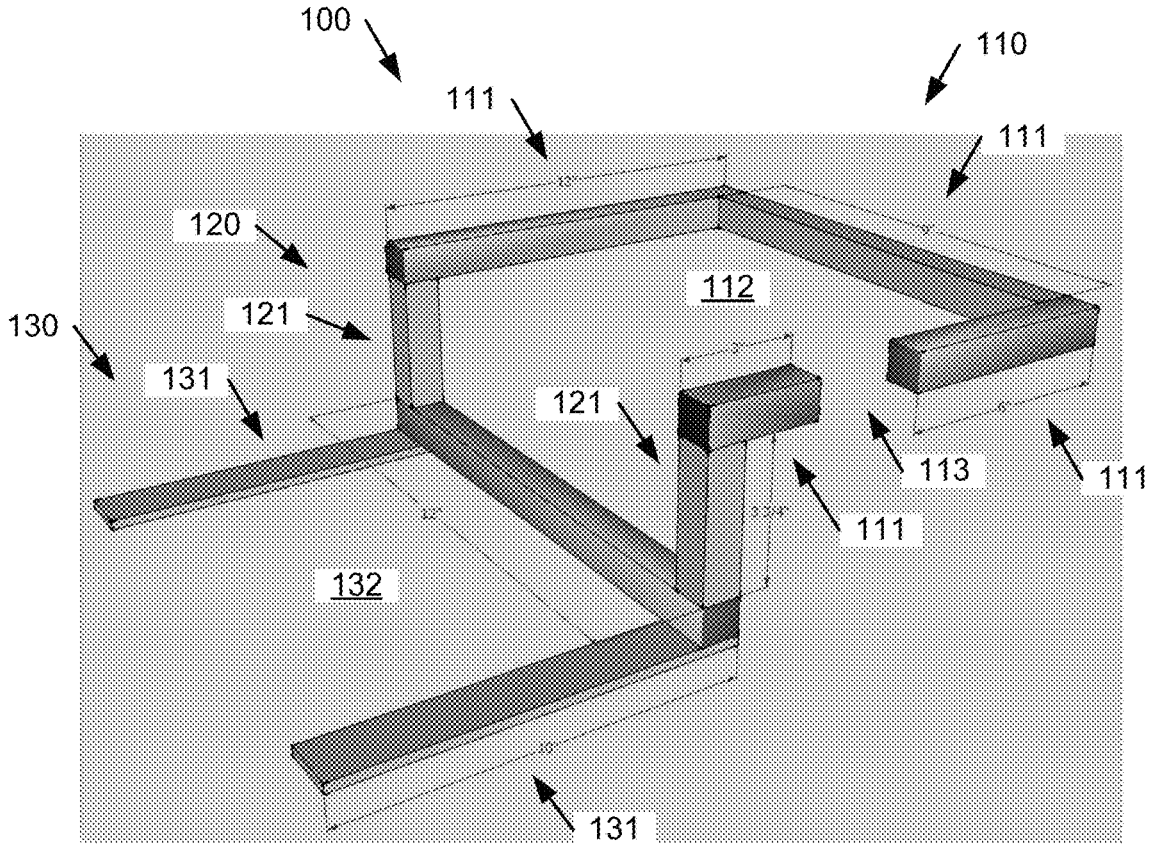

100
110
111
111
120
112
130
121
131
121
113
111
111
132
131

FIG. 2A

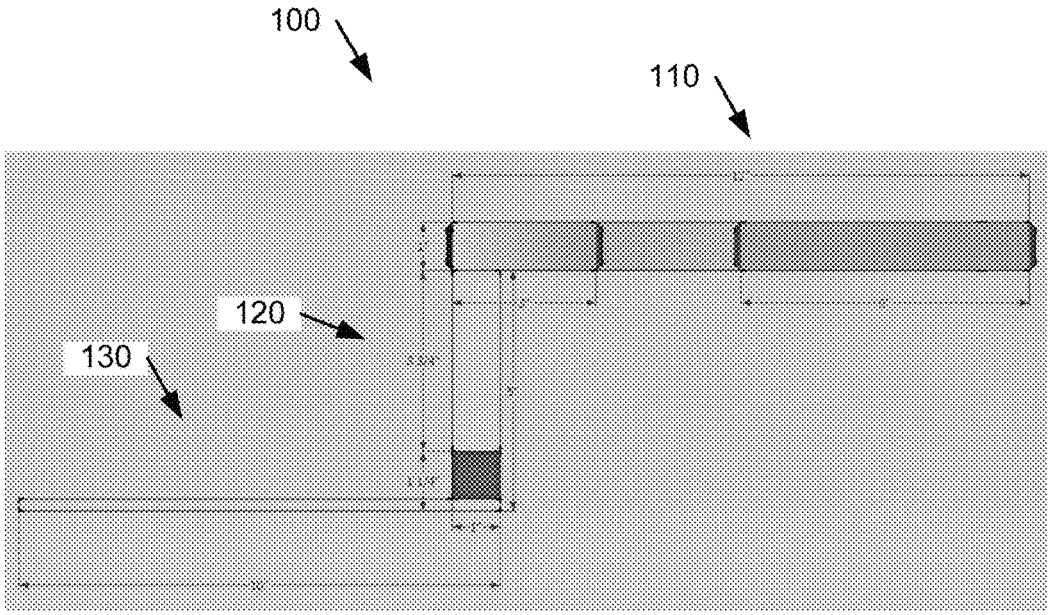

100
110
120
130

FIG. 2B

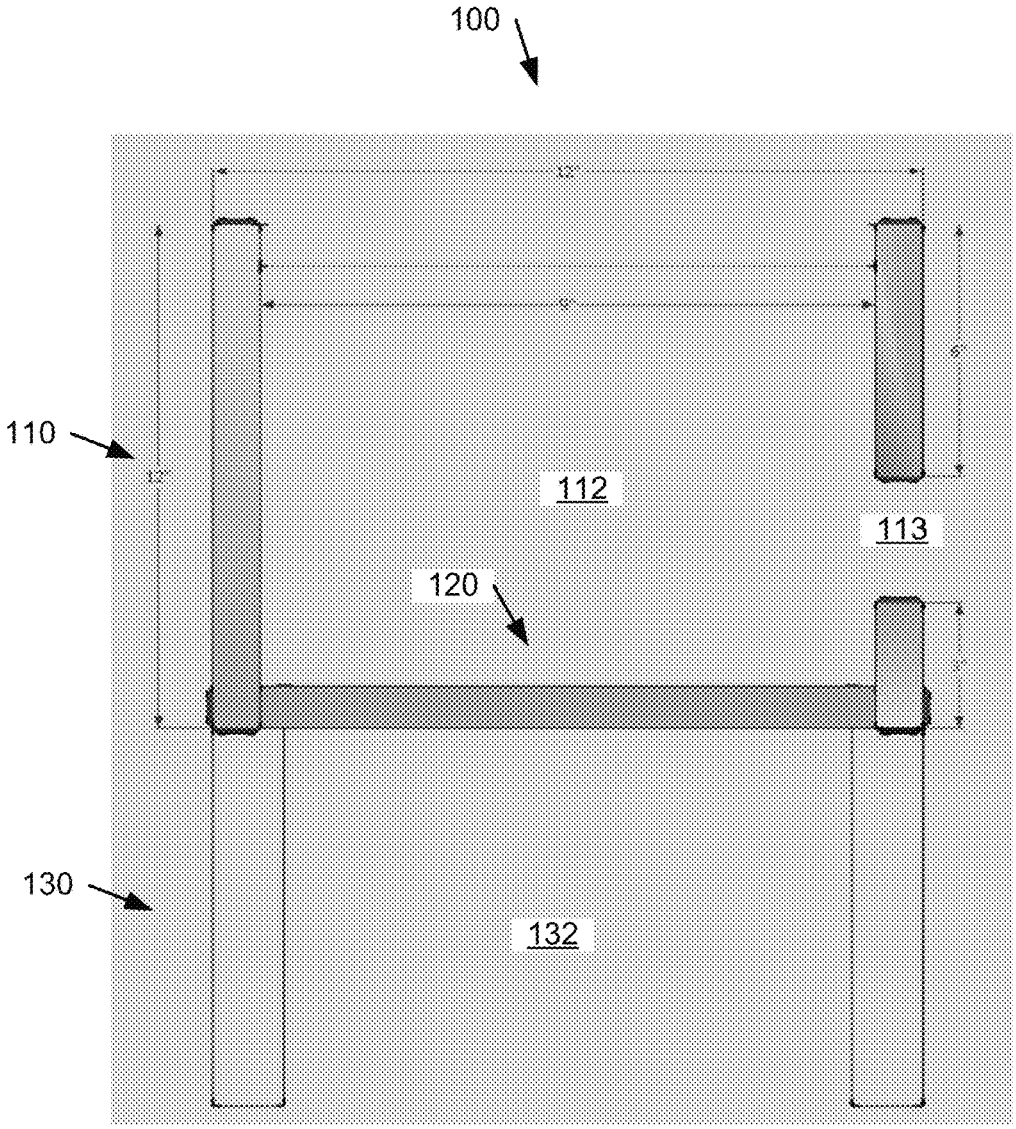


FIG. 2C

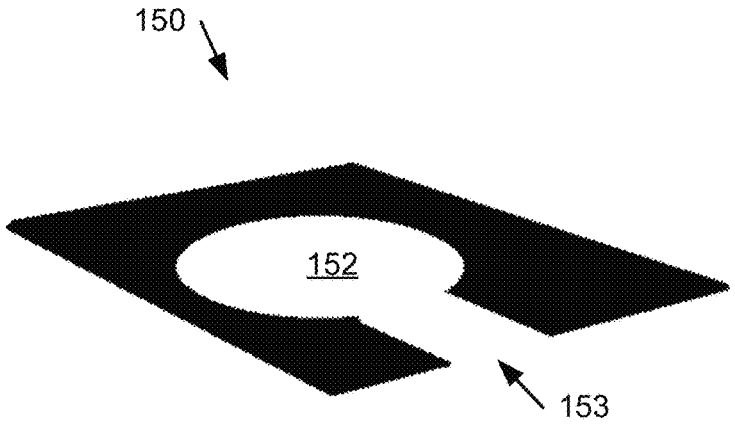


FIG. 2D

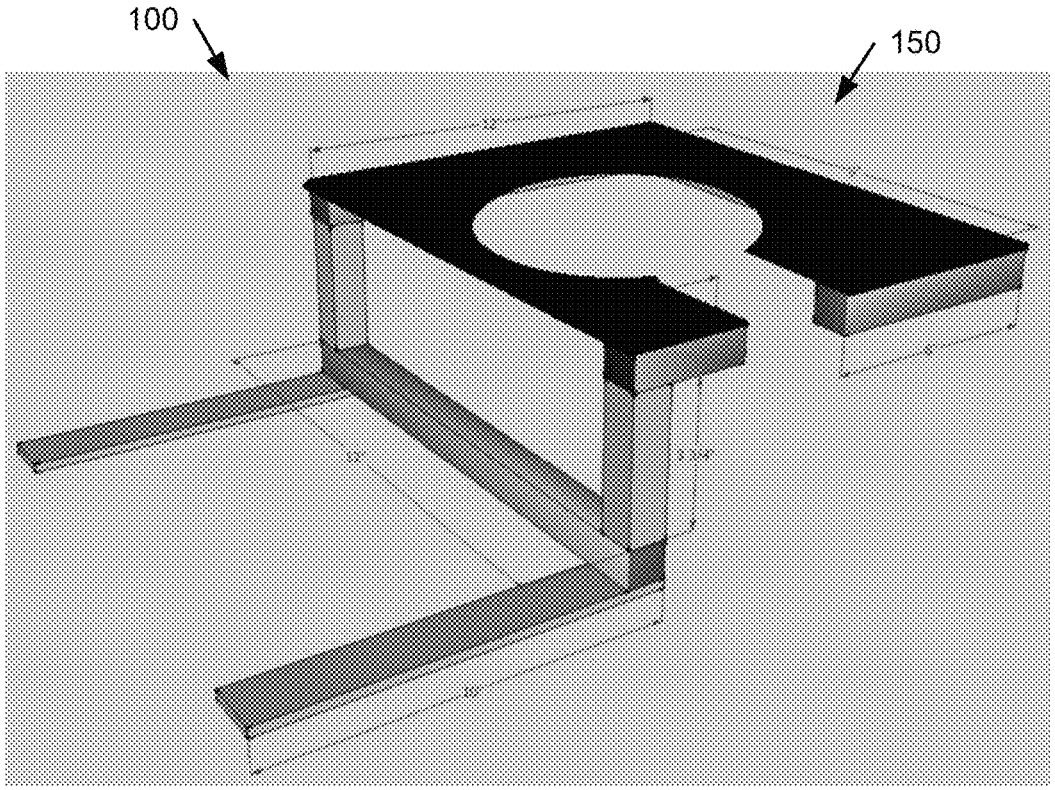


FIG. 2E

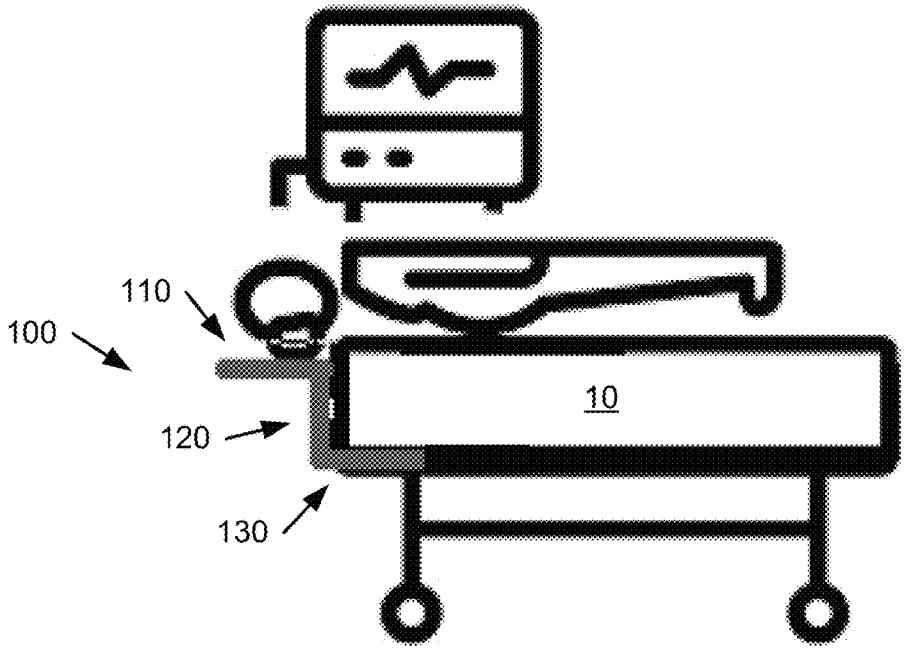


FIG. 3

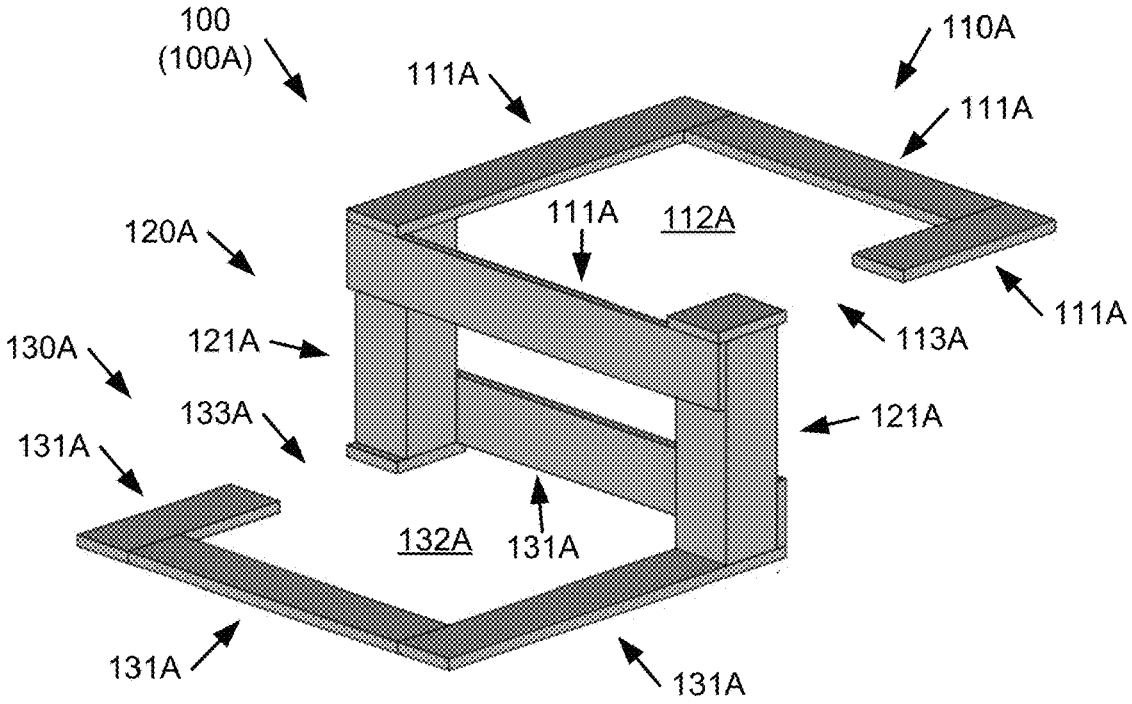

100
(100A)
111A
110A
111A
120A
111A
112A
111A
130A
121A
113A
133A
121A
131A
132A
131A
131A
131A

FIG. 4A

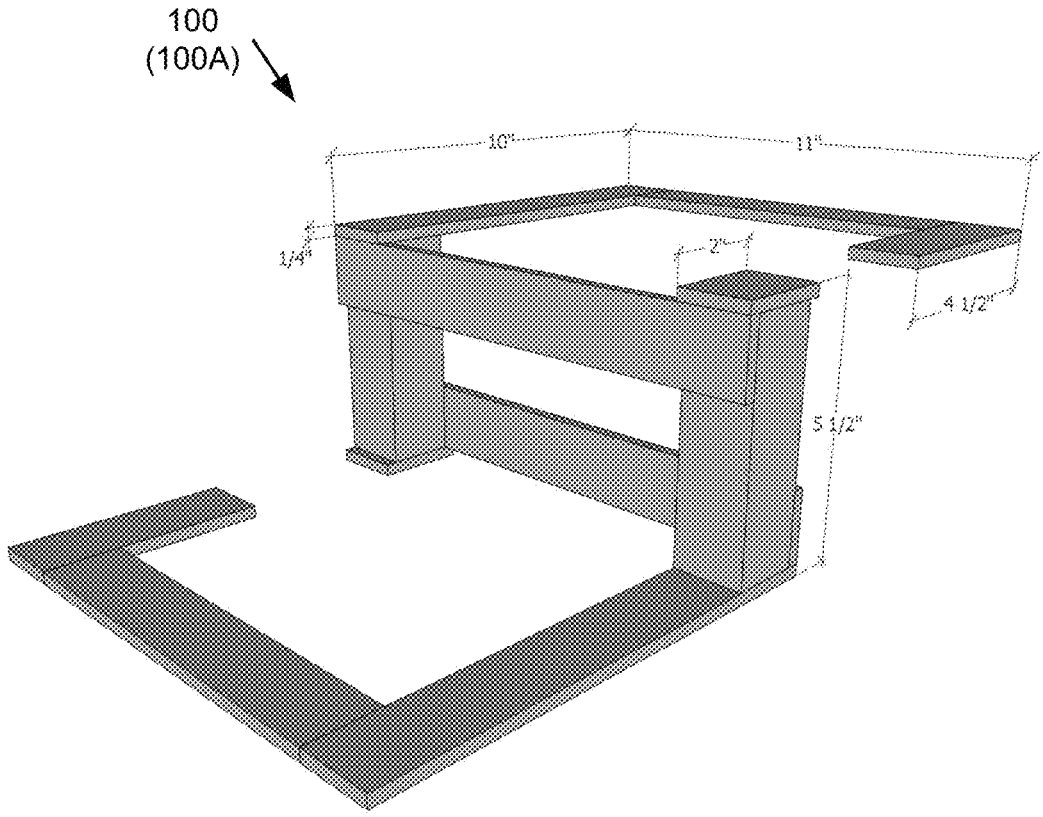

100
(100A)
10"
11"
1/4"
2"
4 1/2"
5 1/2"

FIG. 4B

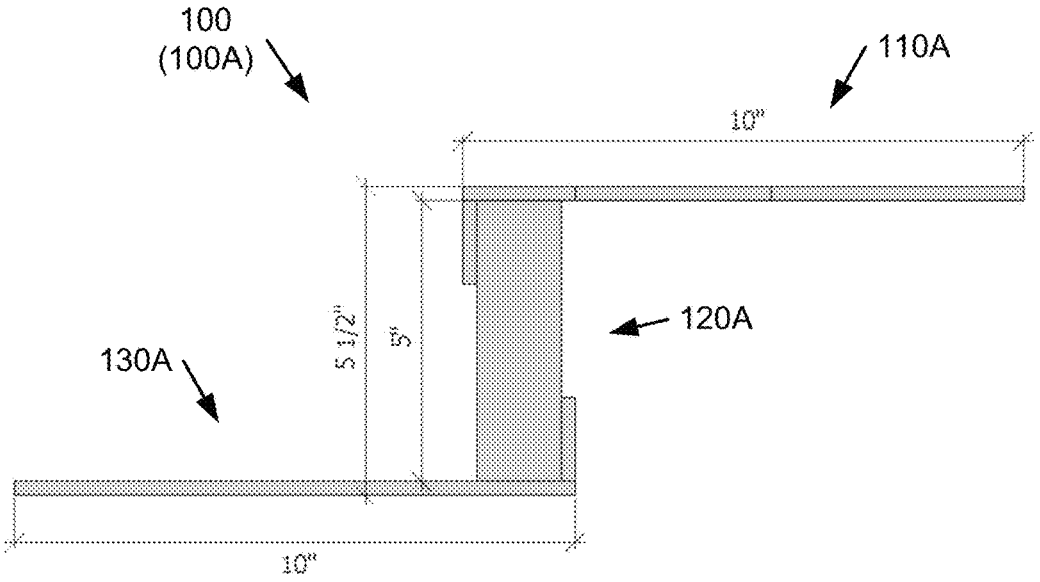

100
(100A)
110A
10"
5 1/2"
5"
120A
130A
10"

FIG. 4C

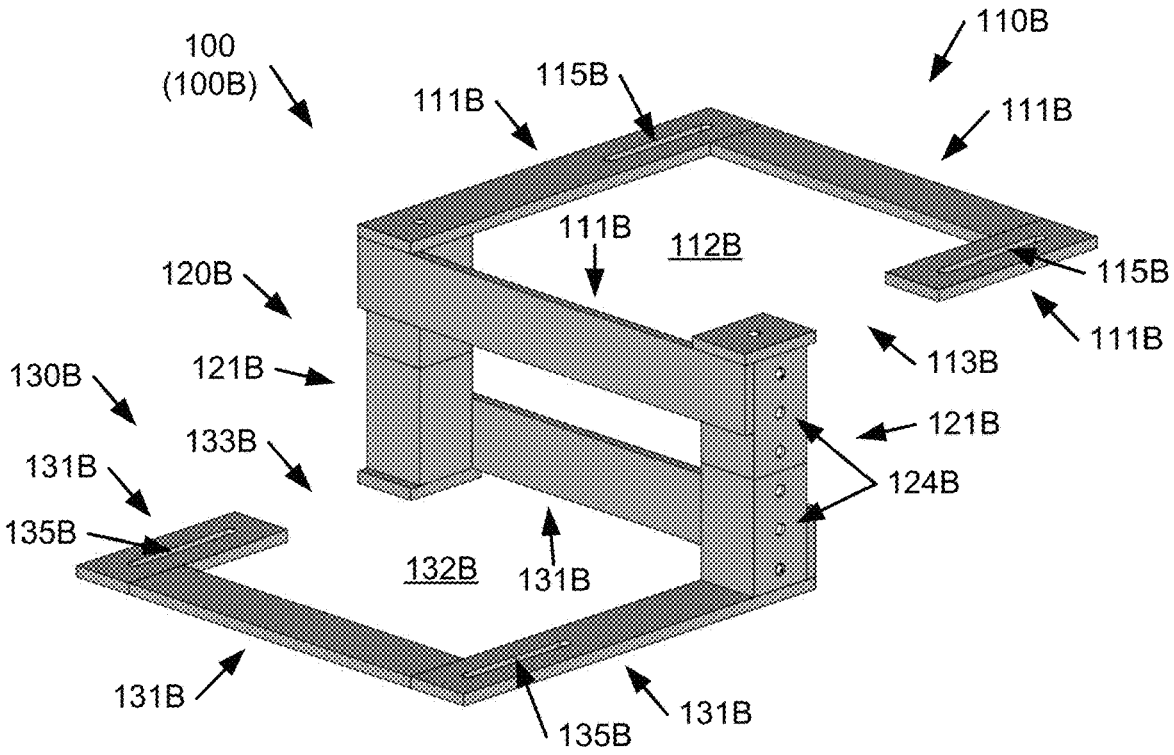

100
(100B)
110B
111B
115B
111B
111B
112B
115B
111B
120B
113B
121B
130B
121B
133B
124B
131B
135B
132B
131B
131B
135B
131B

FIG. 5A

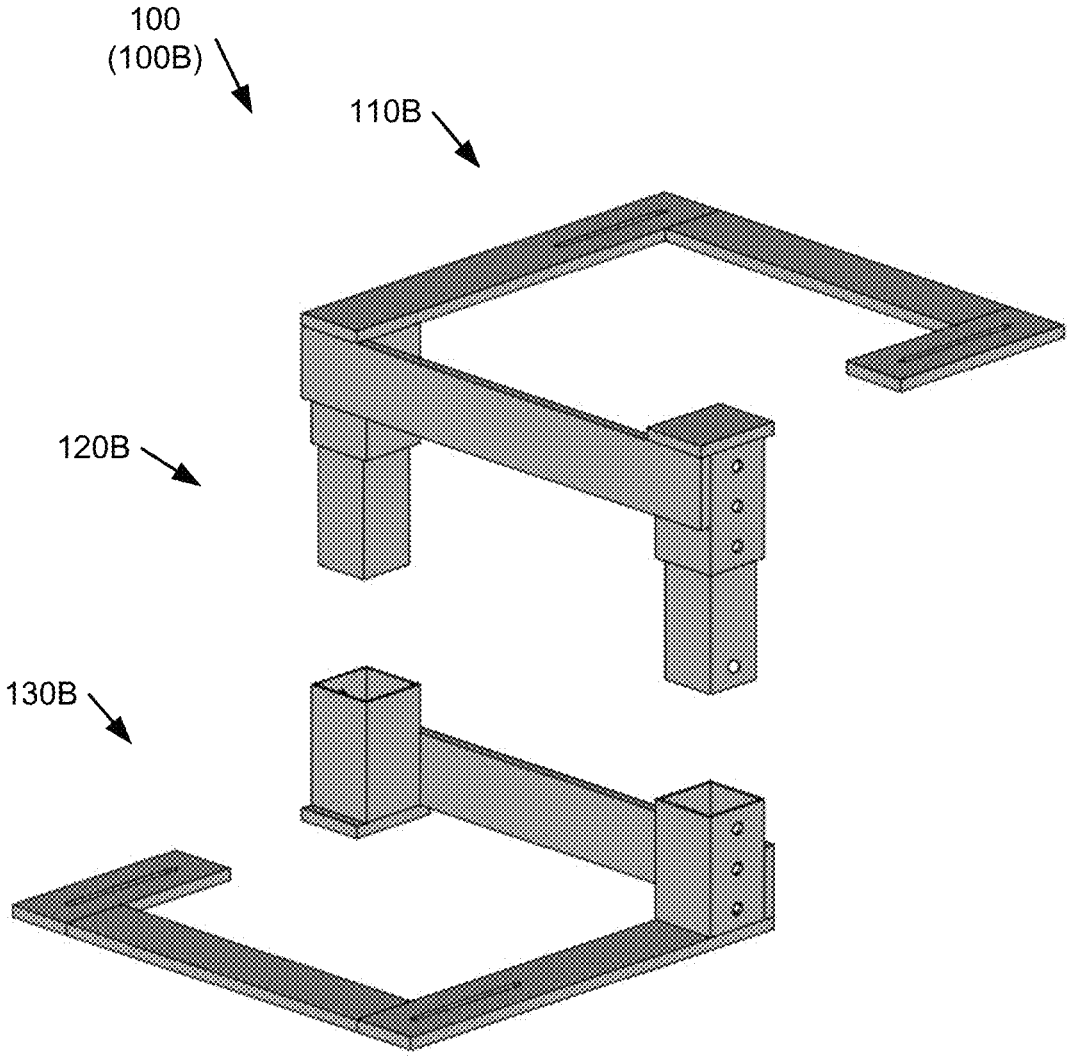


FIG. 5B

Parts List		
Item	Qty	Description
#1	2	1-1/2"x3-1/2"x1/4" Steel w/ 1/4" hole
#2	2	1-1/2"x4-1/2"x1/4" Steel w/ 3"x1/4" Groove
#3	2	1-1/2"x9"x1/4" Flat
#4	2	1-1/2"x10"x1/4" w Hole and Groove
#5	2	1-1/2"x11"x1/4" Steel
#6	4	1-1/2" sq x 2-1/2" x 14ga w/ 3 holes
#7	2	1-1/4" sq x 5" x 10ga Insert

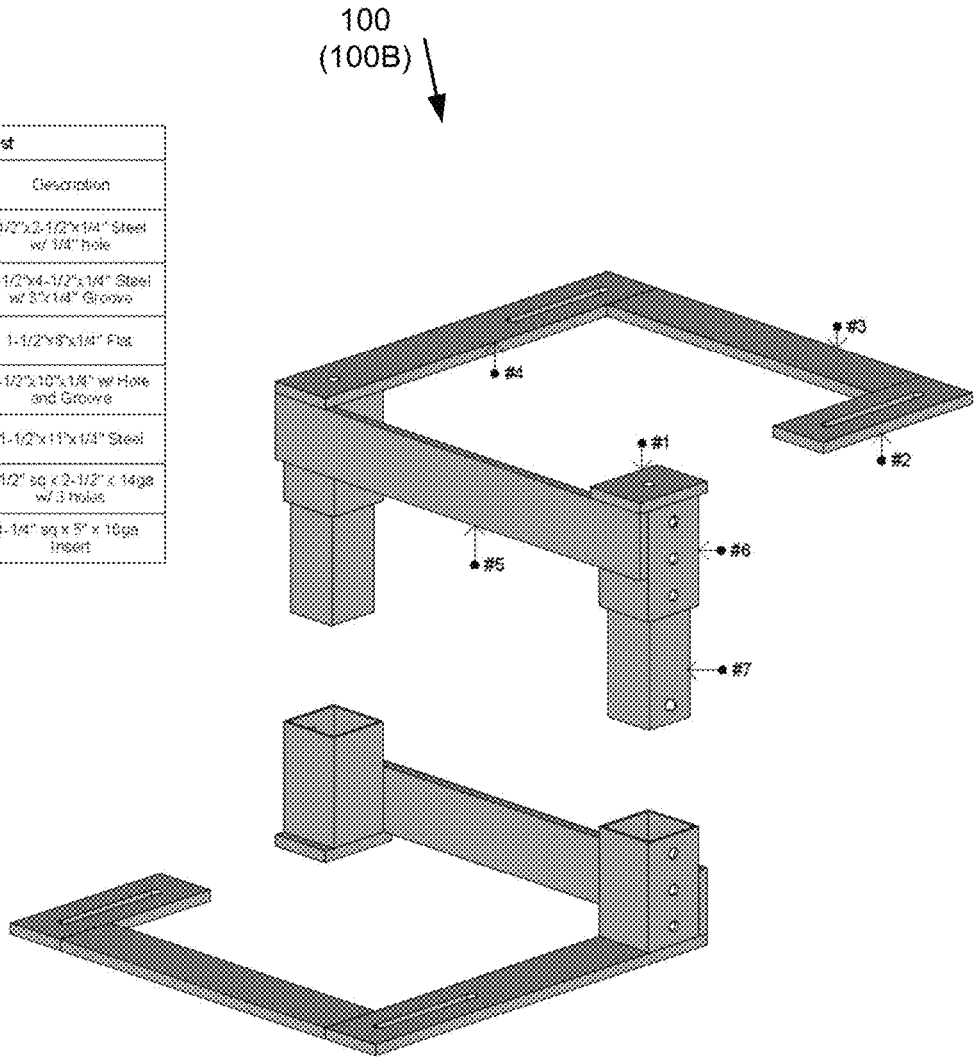


FIG. 5C

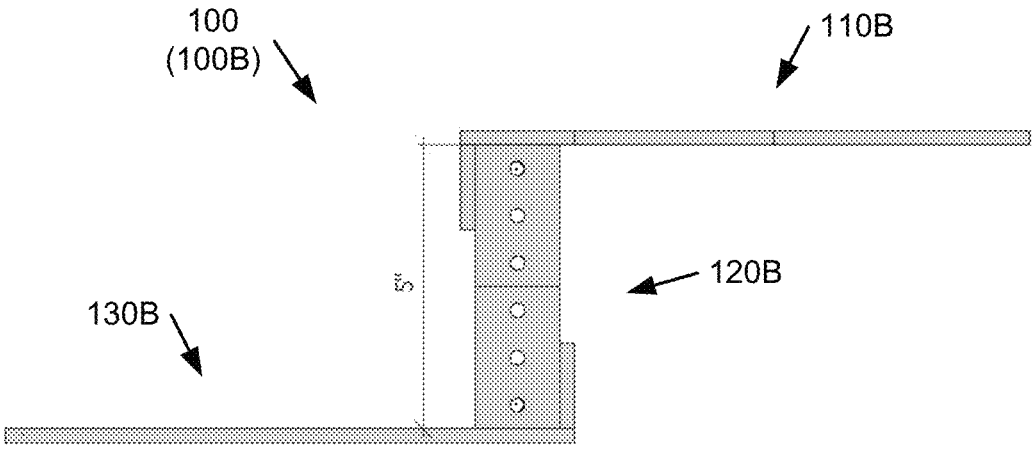


FIG. 5D

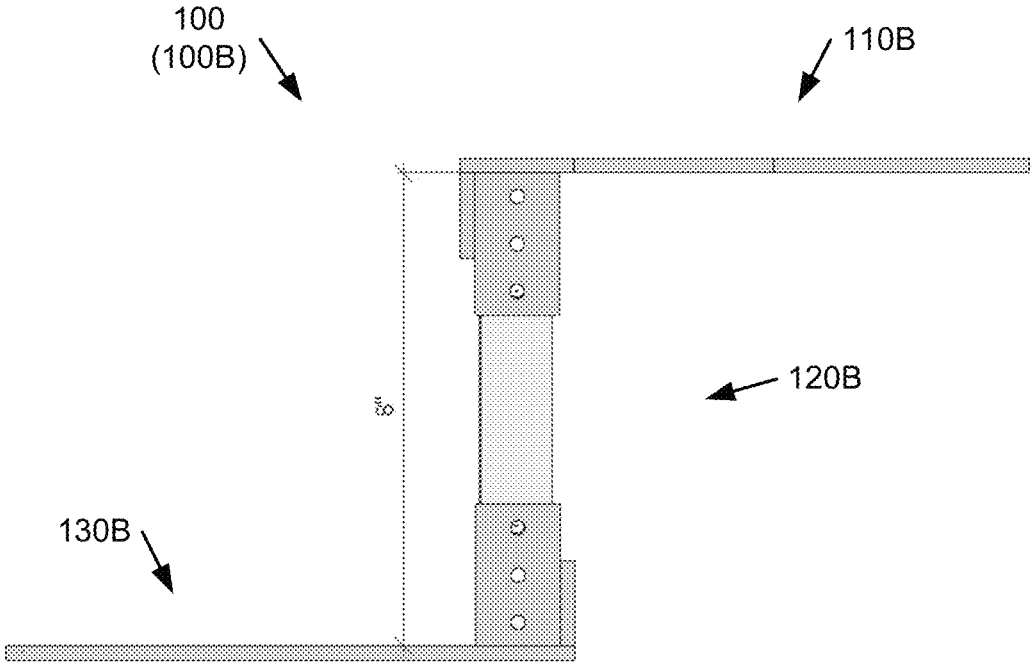


FIG. 5E

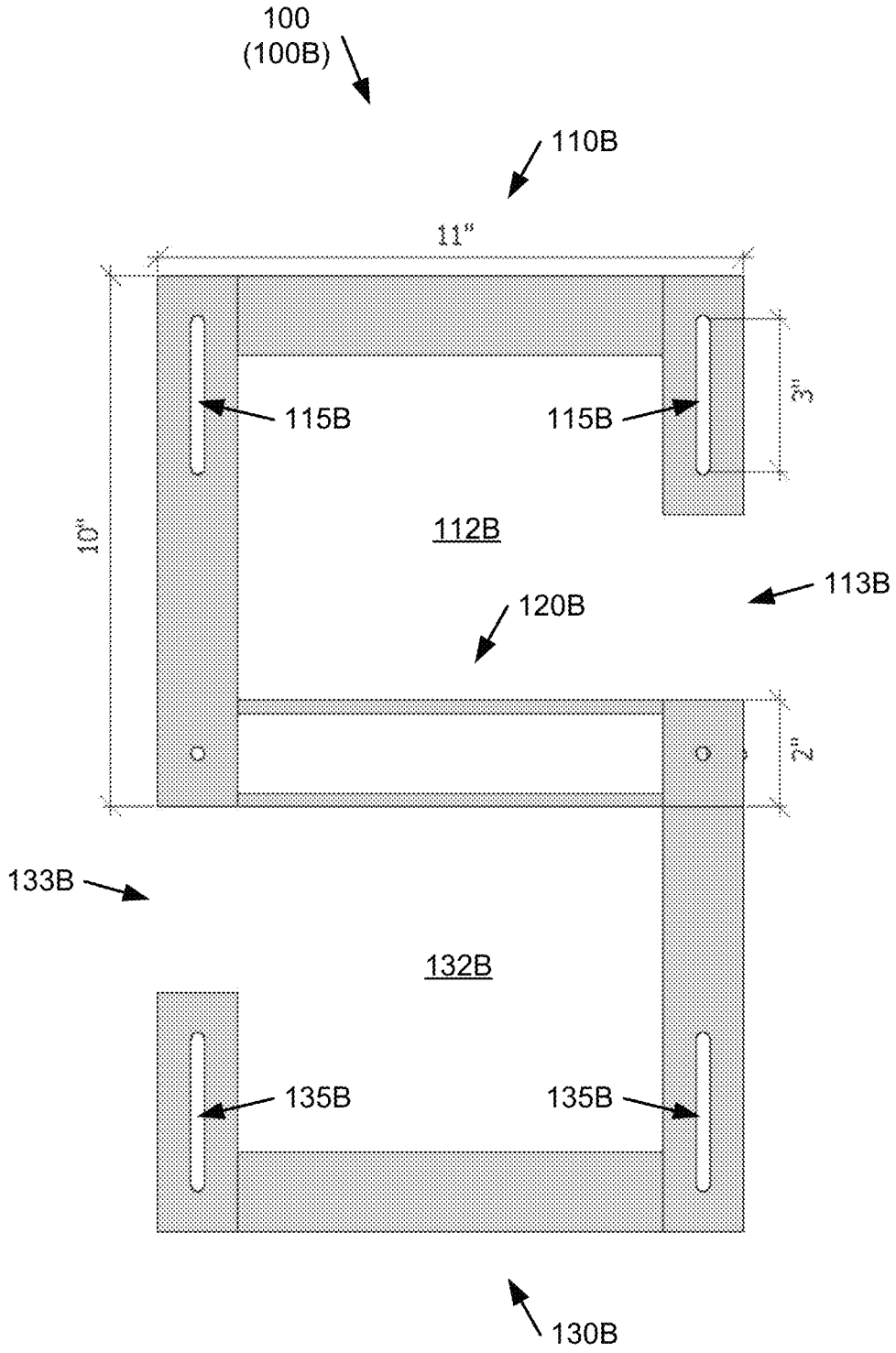

100
(100B)
110B
11"
3"
115B
115B
10"
112B
113B
120B
2"
133B
132B
135B
135B
130B

FIG. 5F

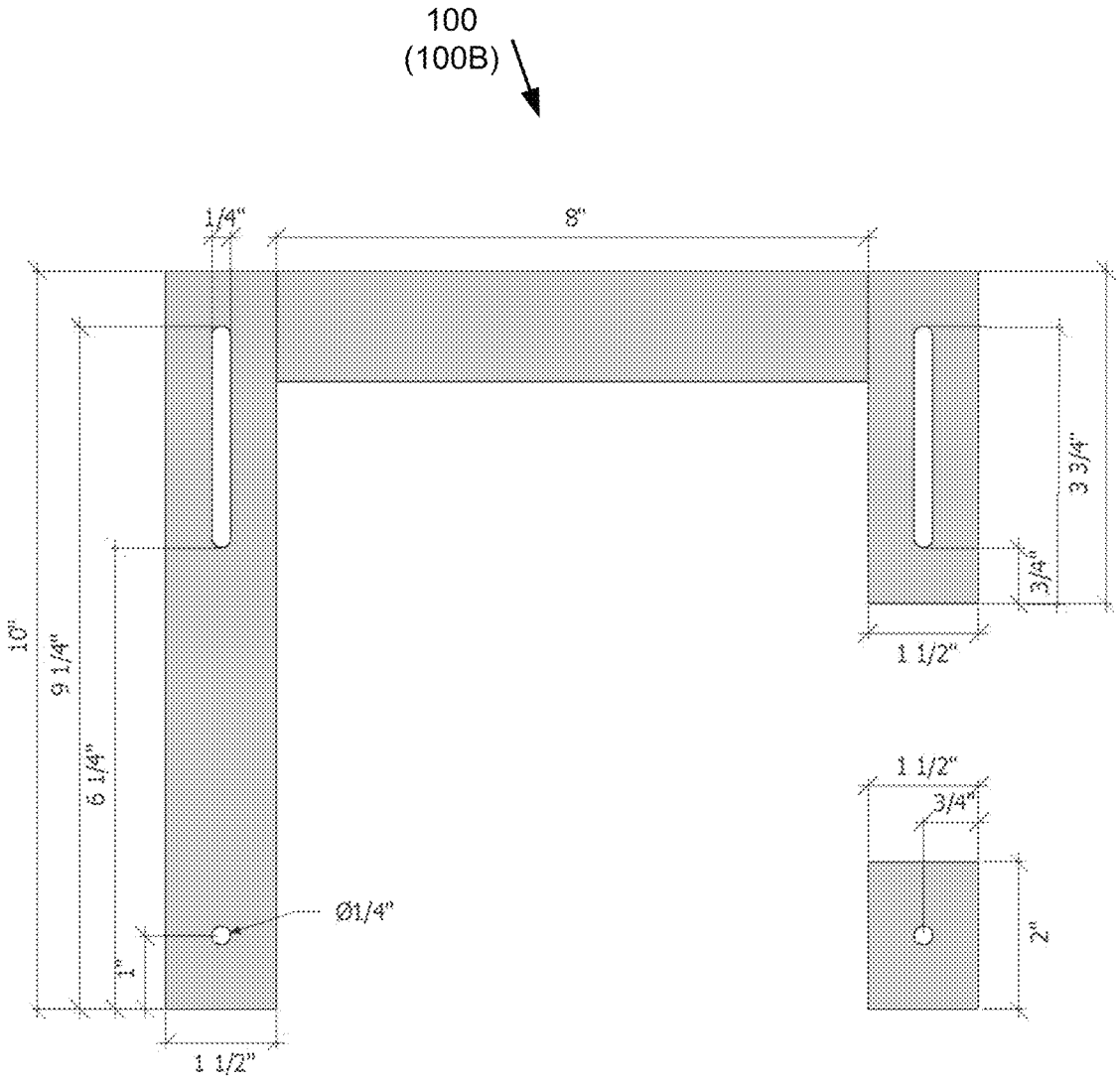


FIG. 5G

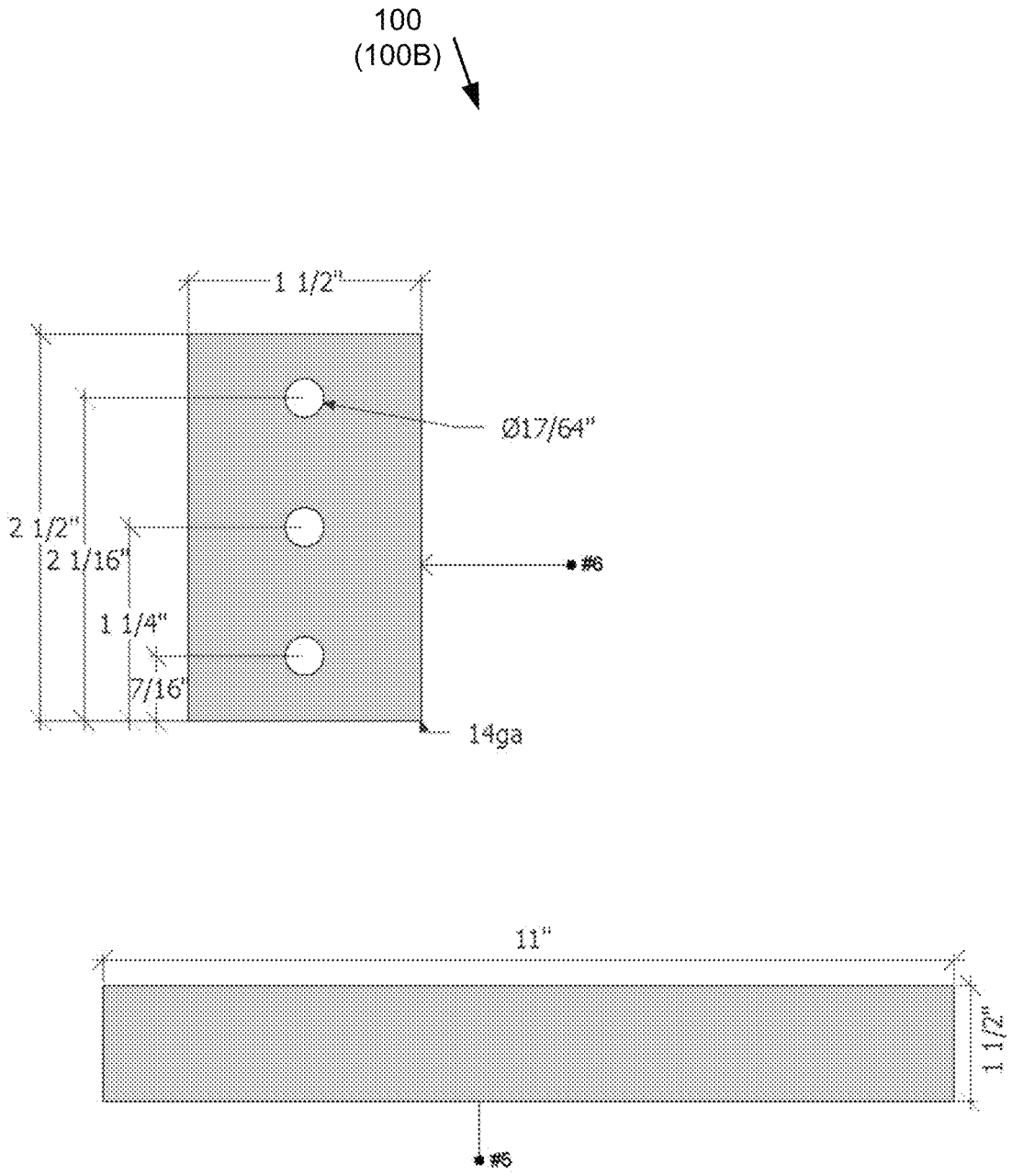


FIG. 5H

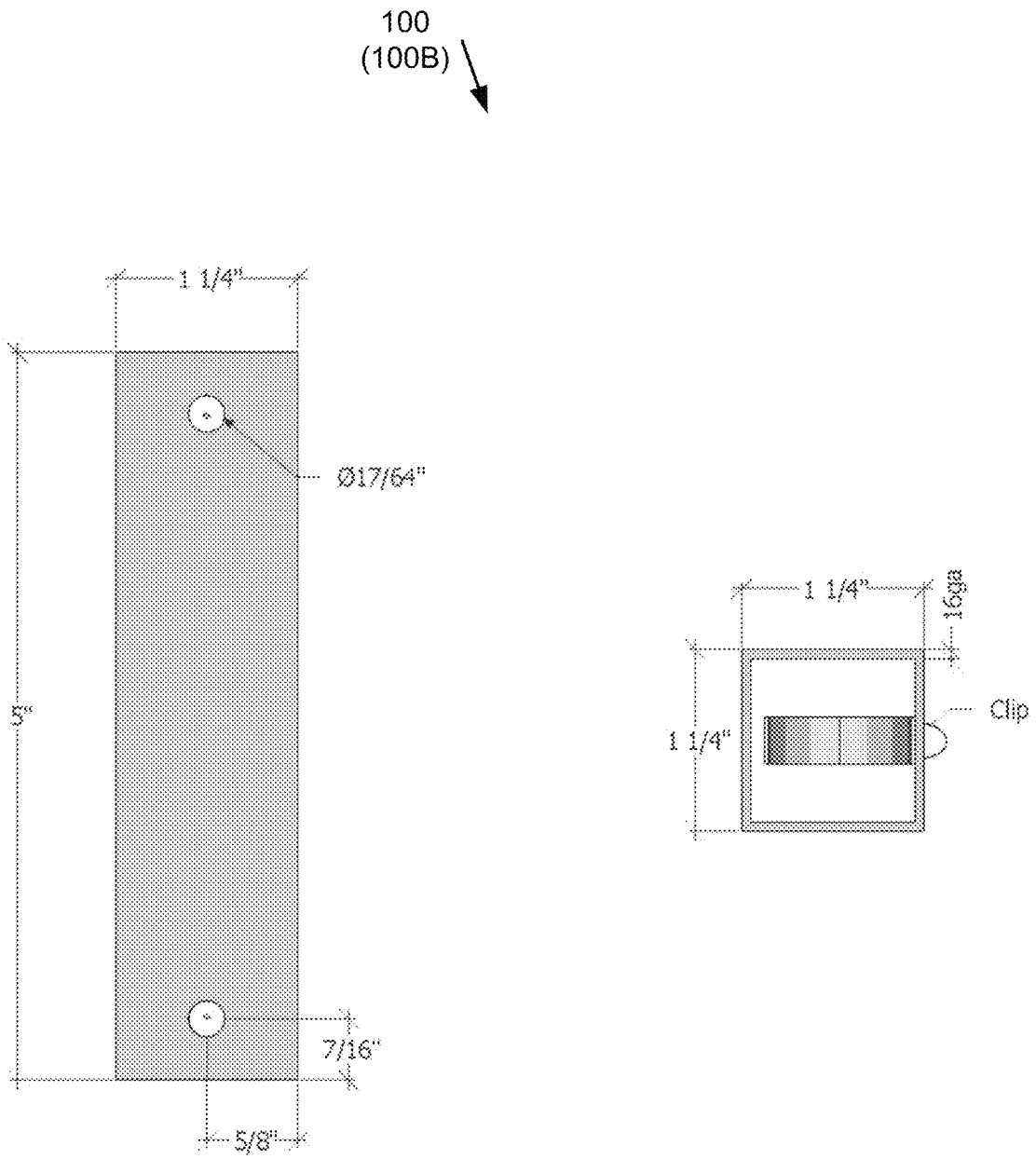


FIG. 5I

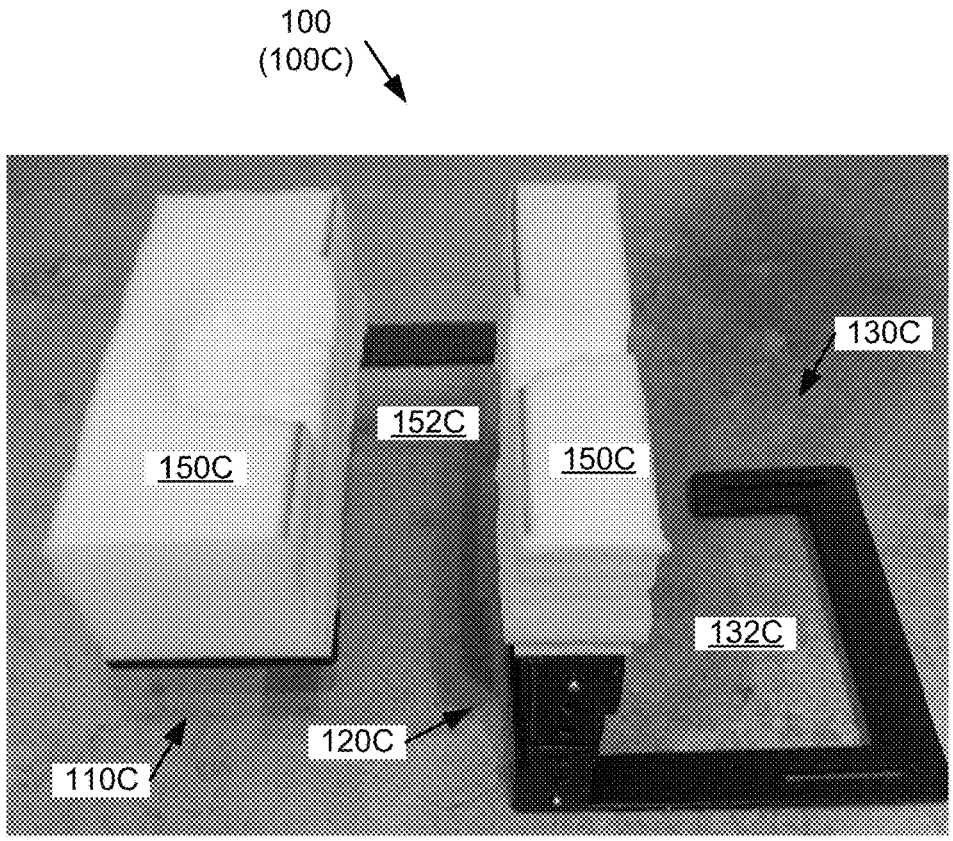

100
(100C)
130C
152C
150C
150C
132C
110C
120C

FIG. 6A

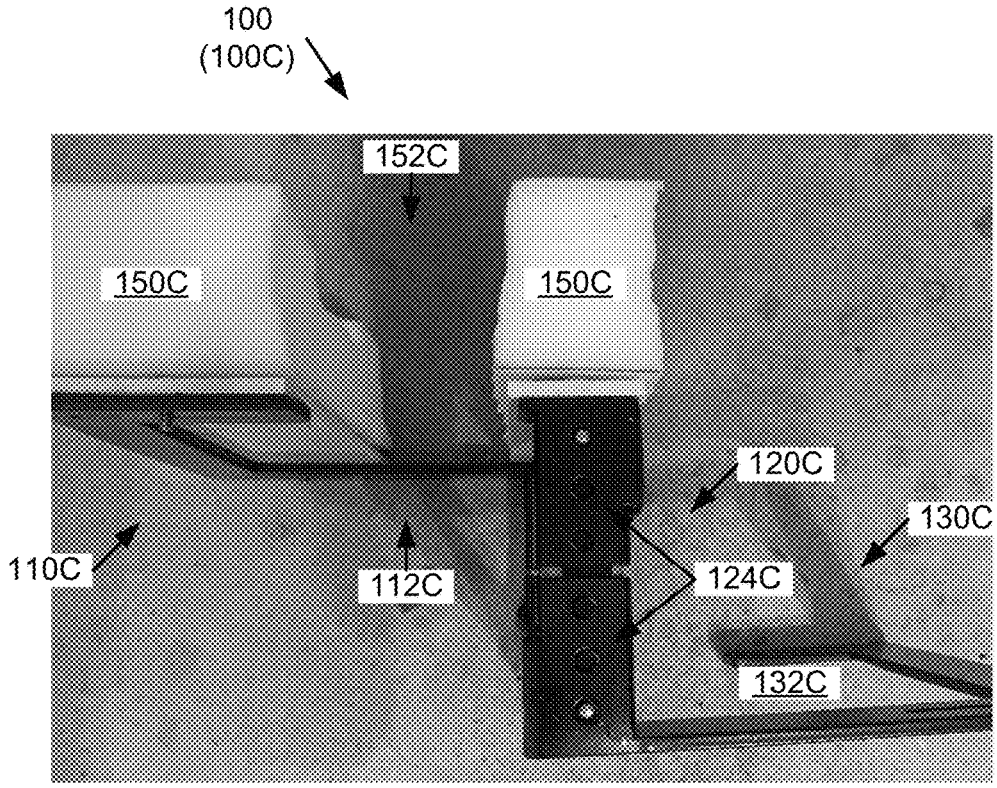

100
(100C)
152C
150C
150C
120C
130C
110C
112C
124C
132C

FIG. 6B

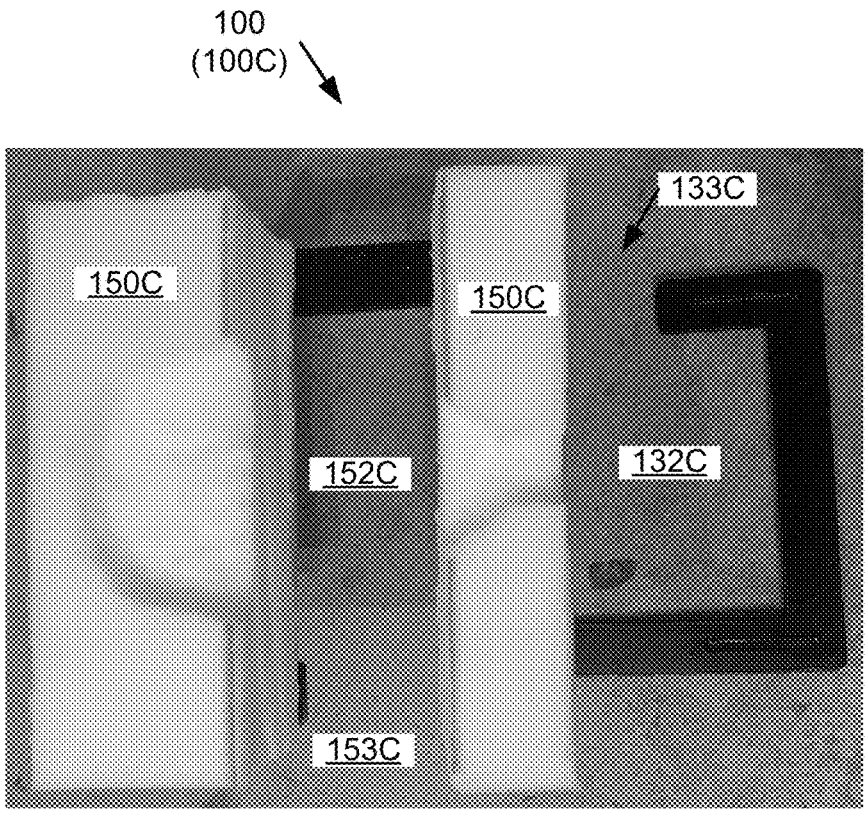

100
(100C)
133C
150C
150C
152C
132C
153C

FIG. 6C

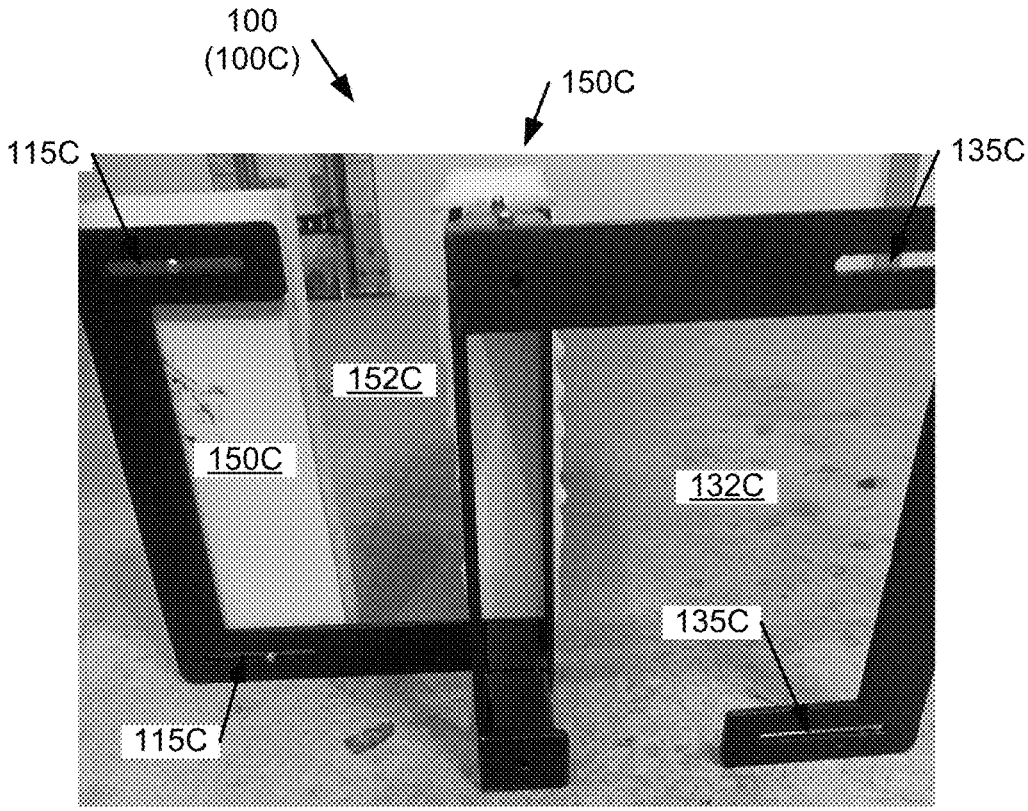

100
(100C)
150C
115C
135C
152C
150C
132C
135C
115C

FIG. 6D

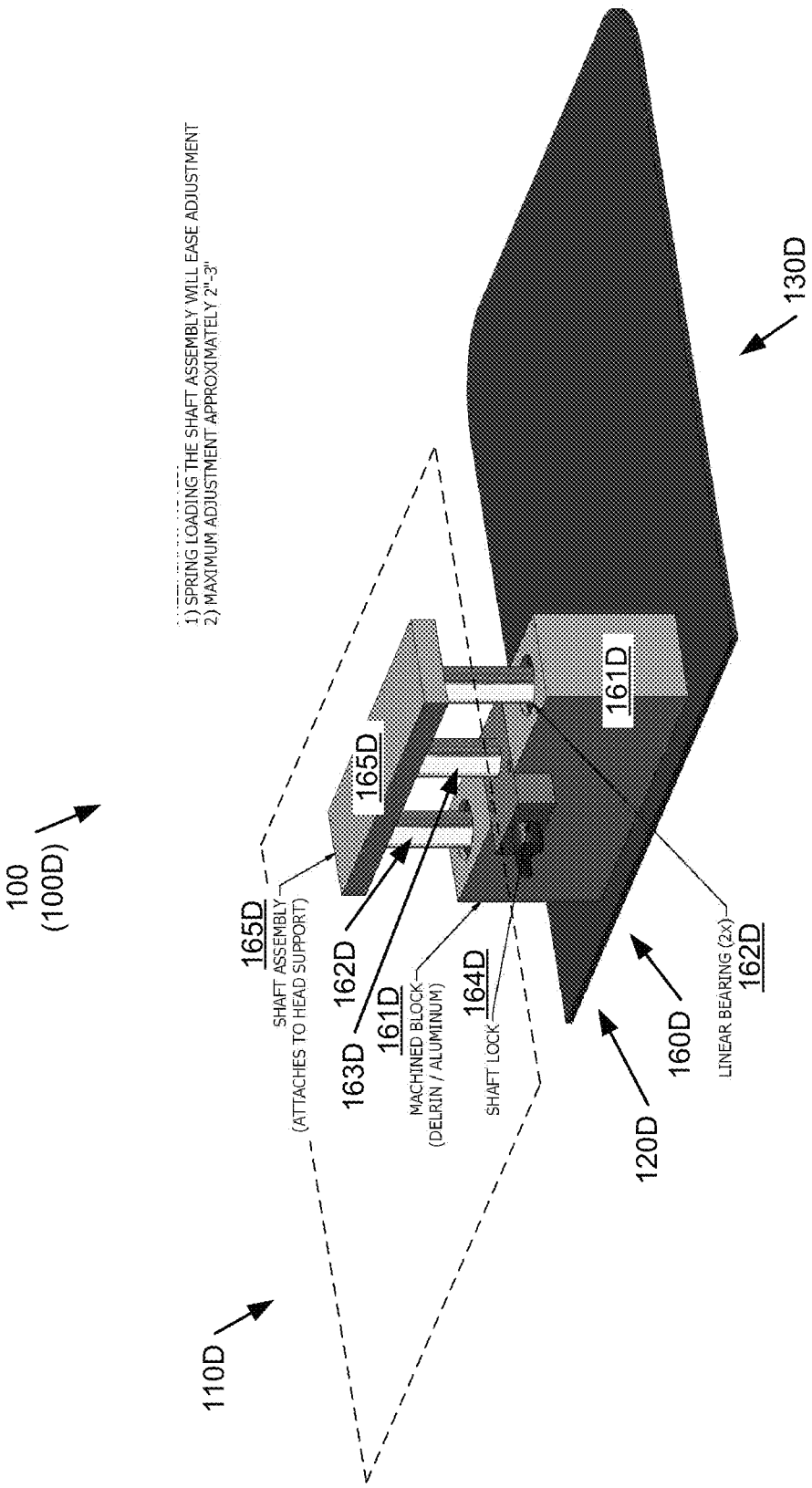

1) SPRING LOADING THE SHAFT ASSEMBLY WILL EASE ADJUSTMENT
2) MAXIMUM ADJUSTMENT APPROXIMATELY 2"-3"
100
(100D)
110D
130D
165D
SHAFT ASSEMBLY
(ATTACHES TO HEAD SUPPORT)
162D
163D
161D
MACHINED BLOCK
(DELRIN / ALUMINUM)
164D
SHAFT LOCK
120D
160D
LINEAR BEARING (2x)
162D
161D

FIG. 7

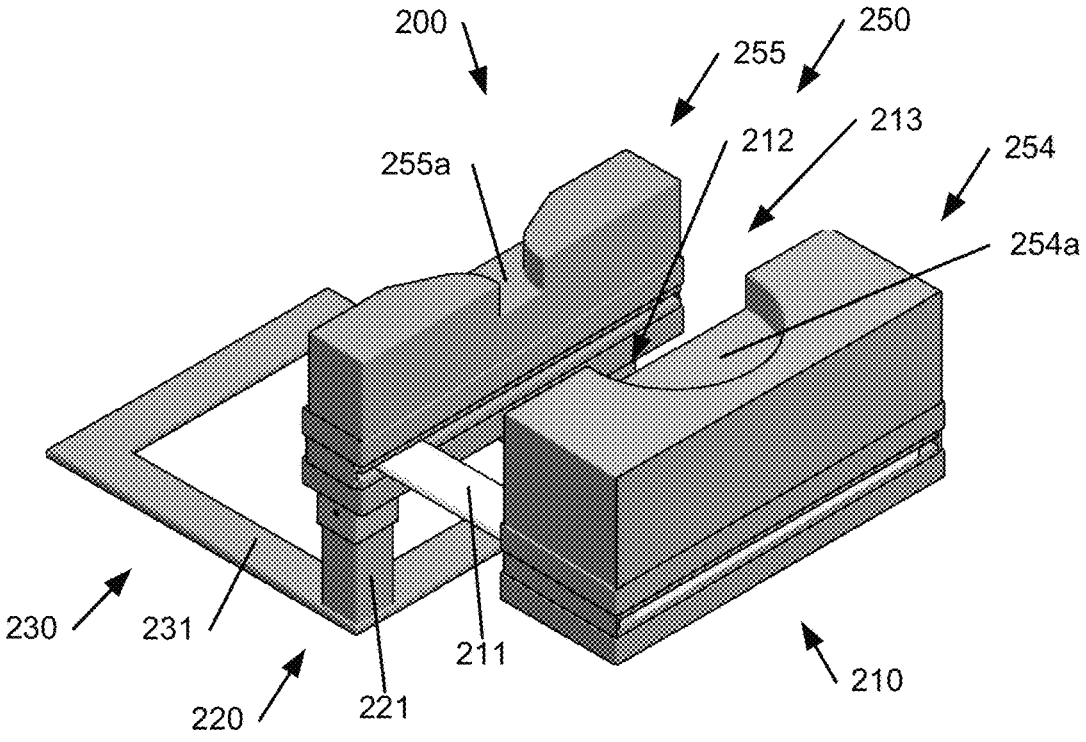

200
255
250
212
213
254
255a
254a
230
231
211
220
221
210

FIG. 8A

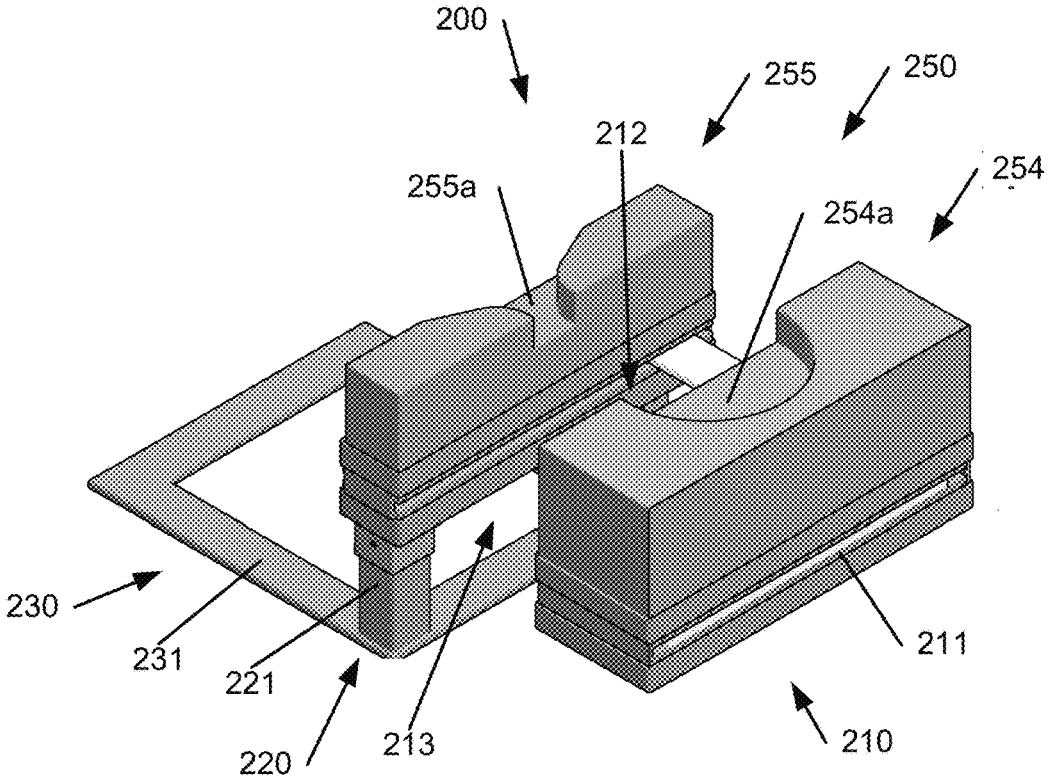

200
255
250
212
254
255a
254a
230
231
221
211
220
213
210

FIG. 8B

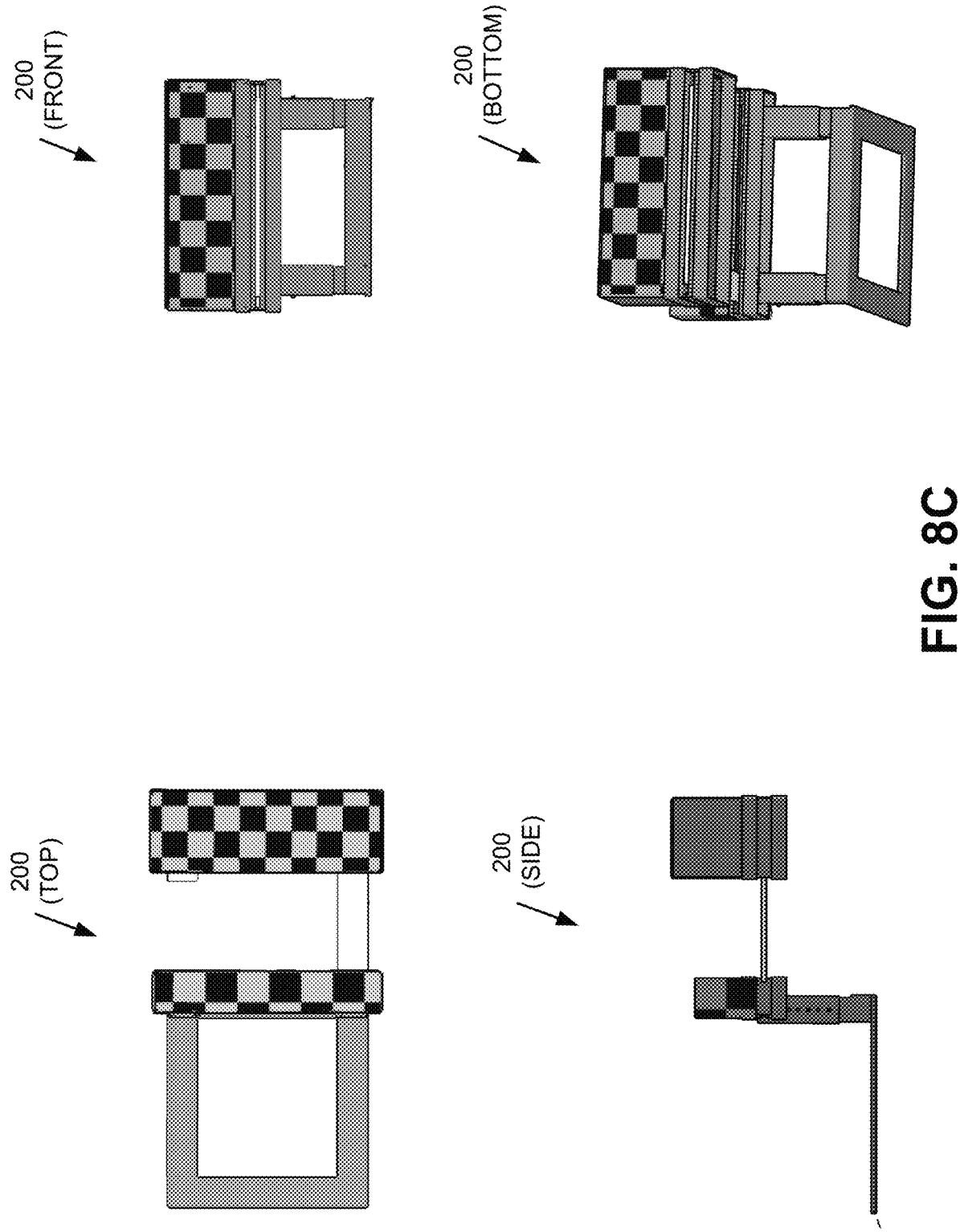


FIG. 8C

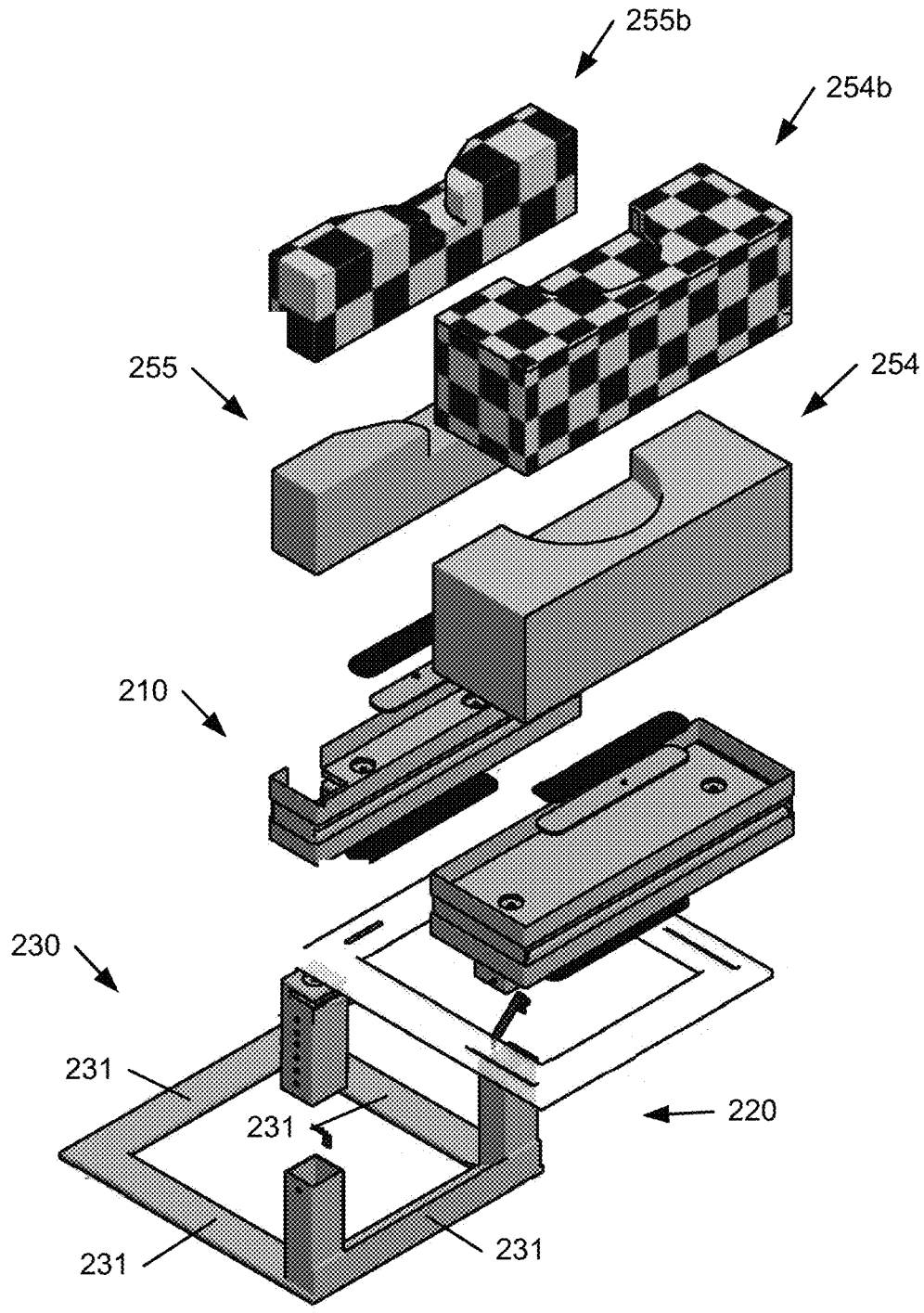


FIG. 8D

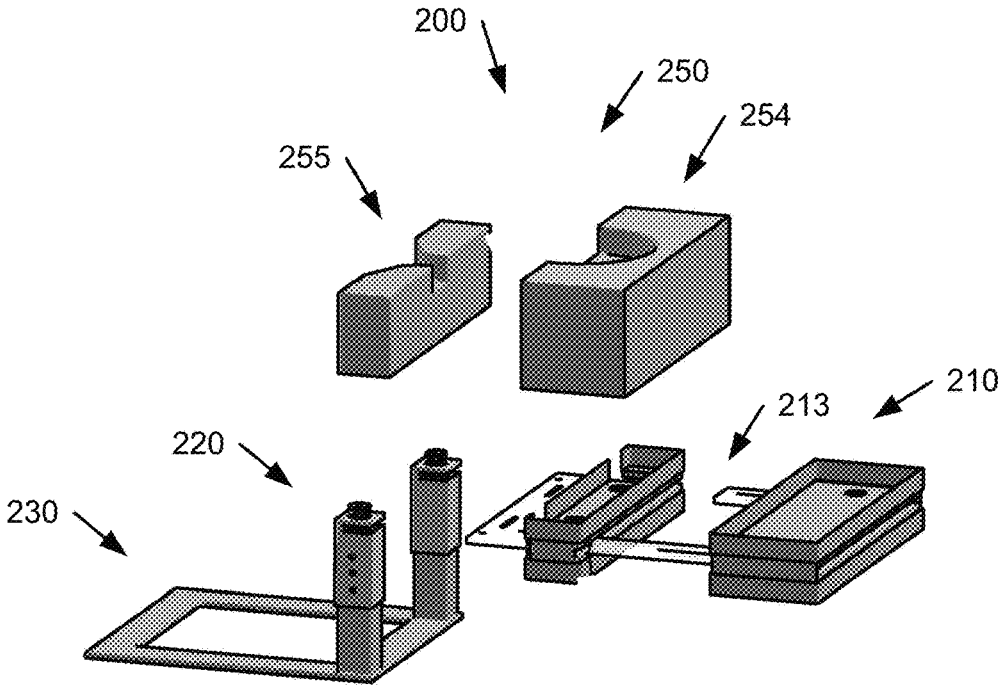


FIG. 8E

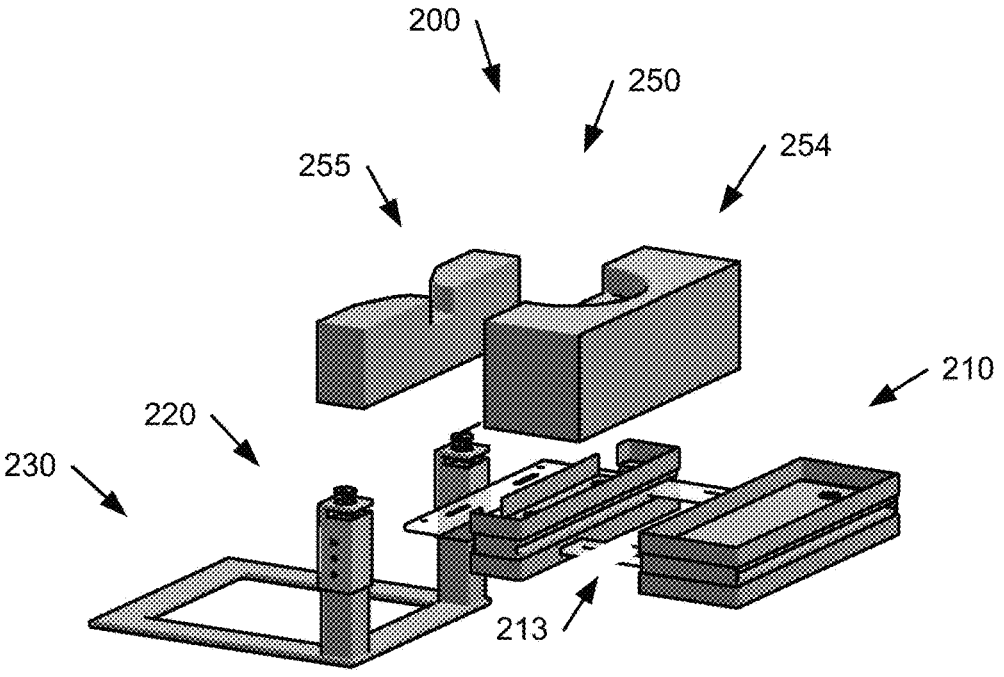


FIG. 8F

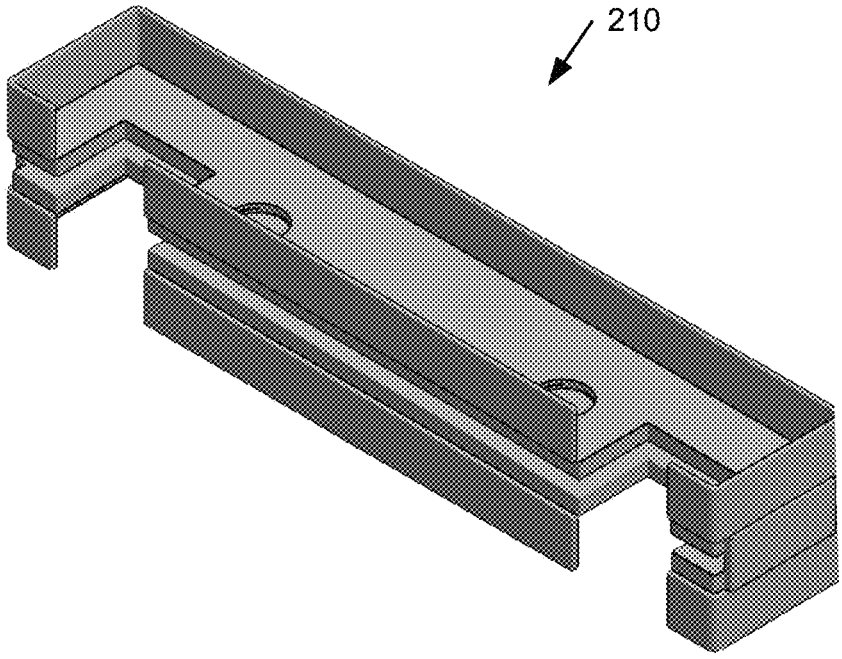


FIG. 8G

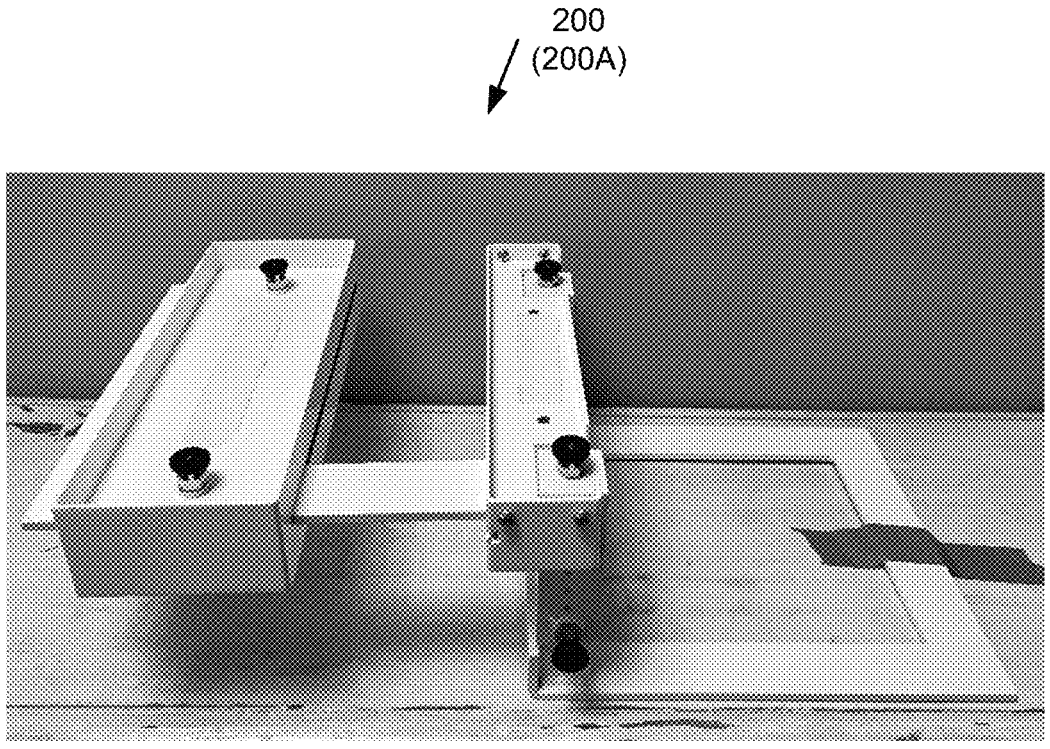


FIG. 9A

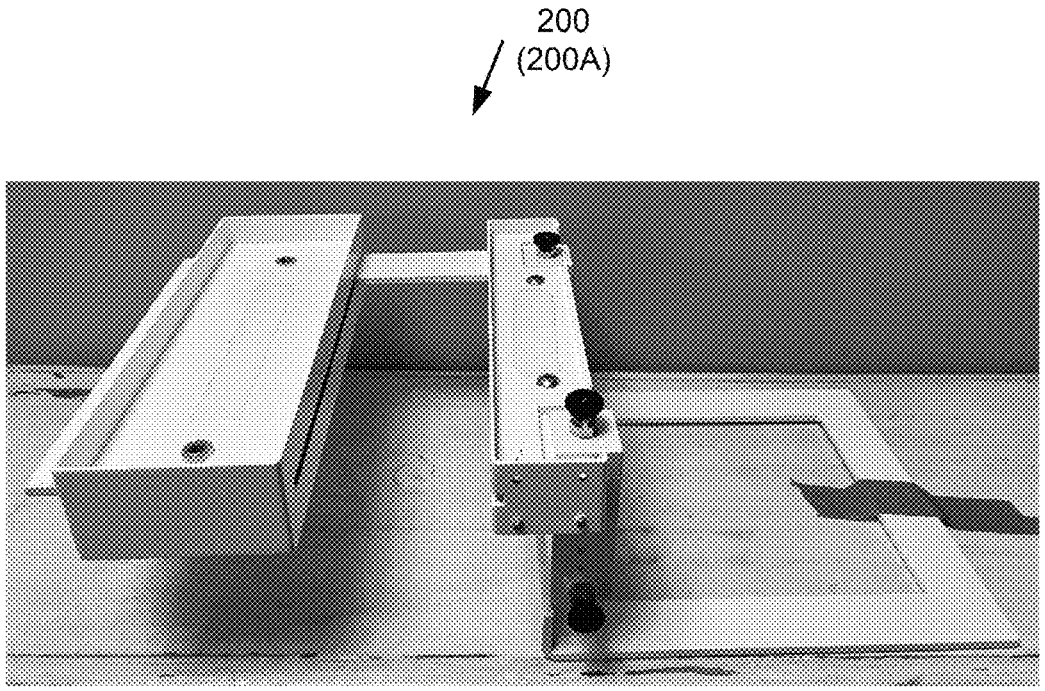


FIG. 9B

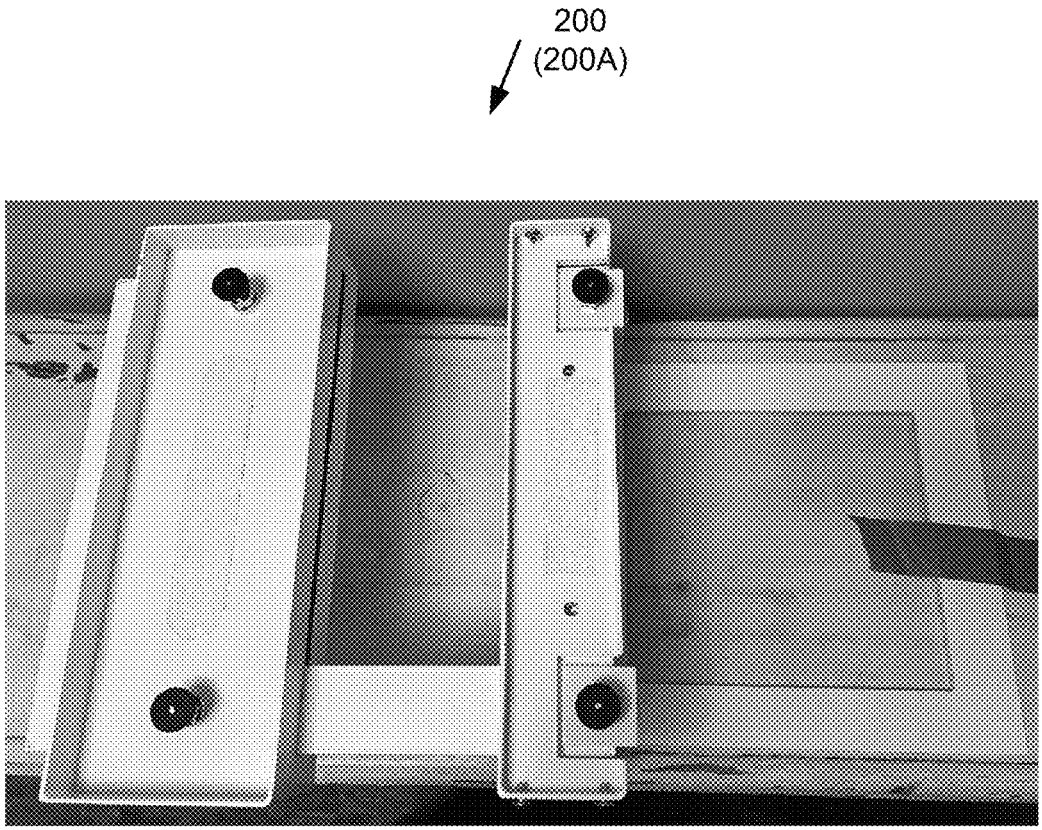


FIG. 9C

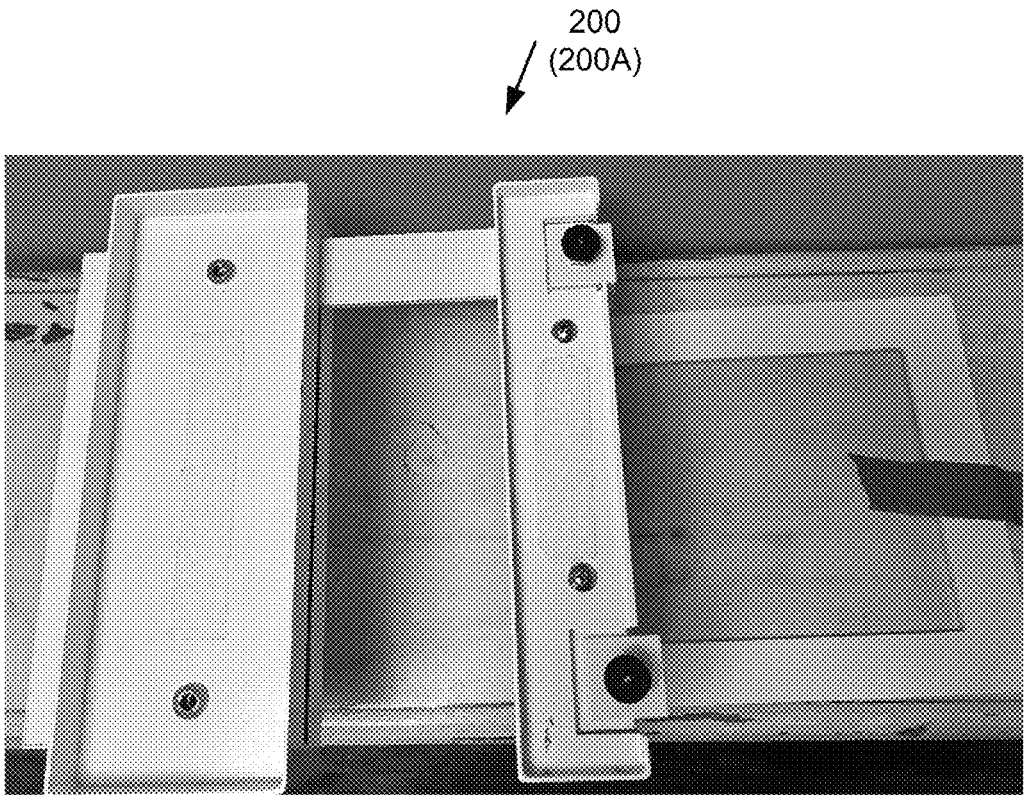
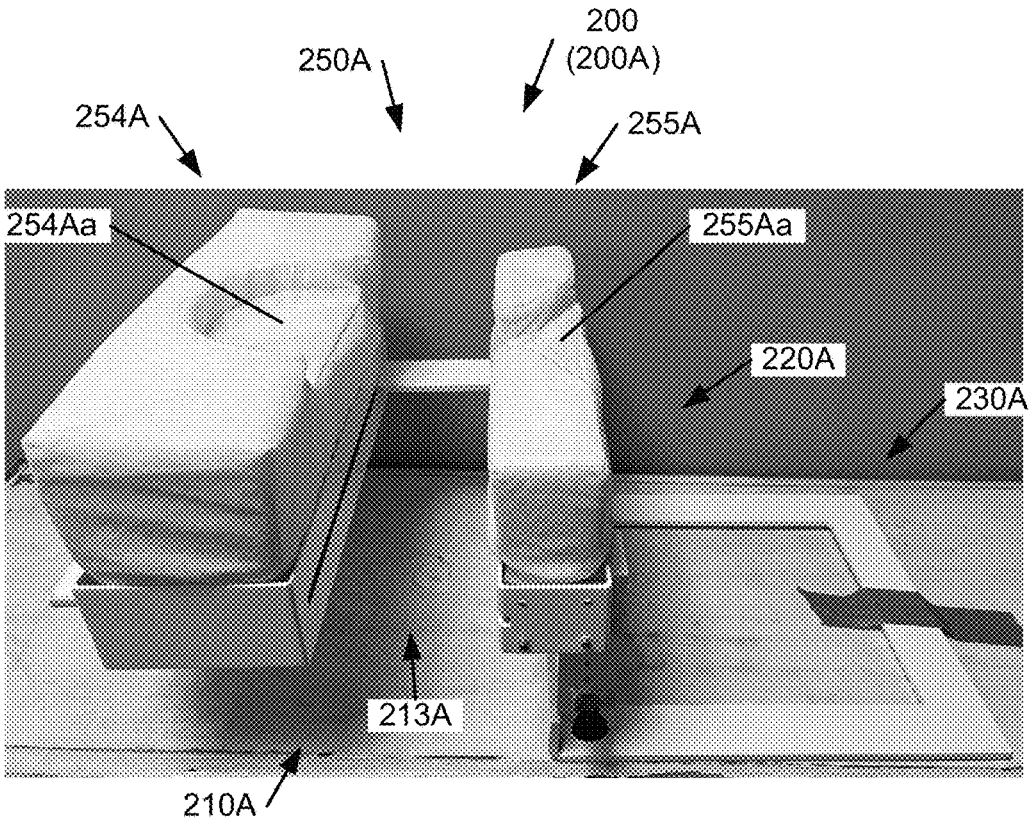

200
(200A)

FIG. 9D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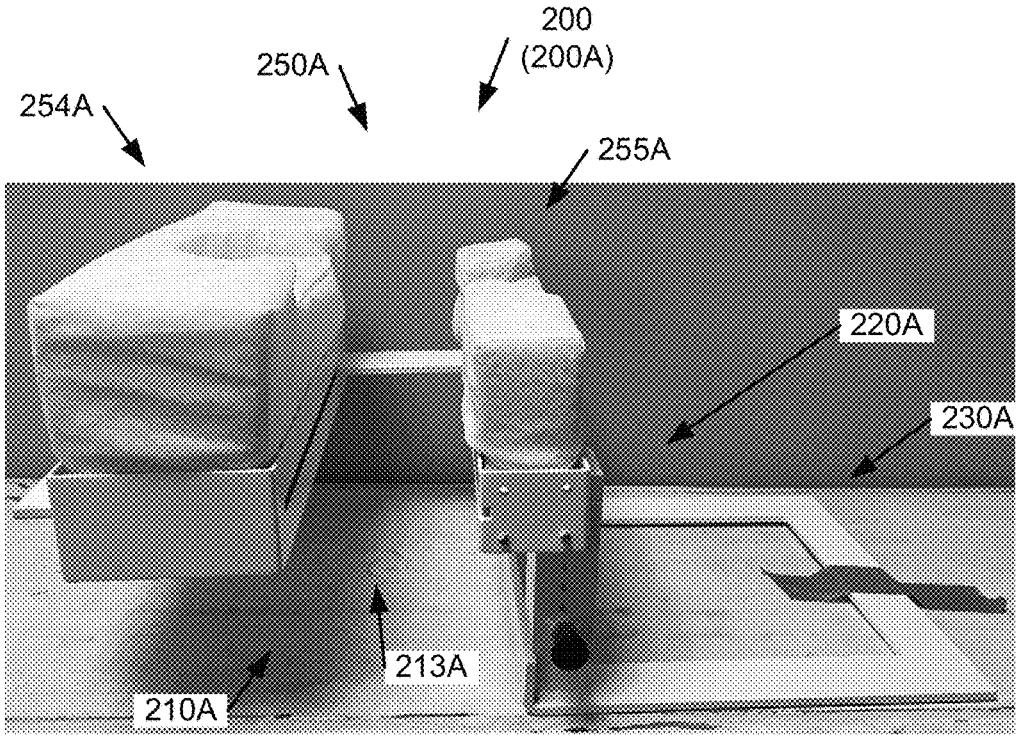
(200A)
250A
254A
255A
254Aa
255Aa
220A
230A
213A
210A

FIG. 9E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(200A)
250A
254A
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220A
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213A
210A

FIG. 9F

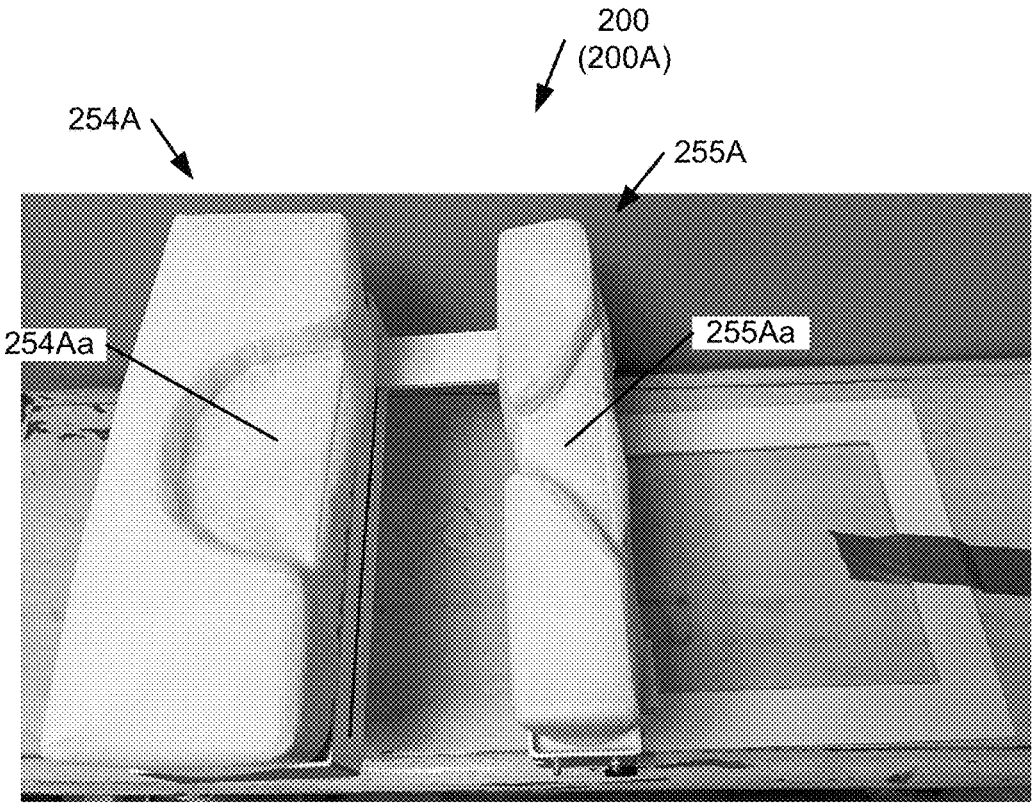
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FIG. 9G

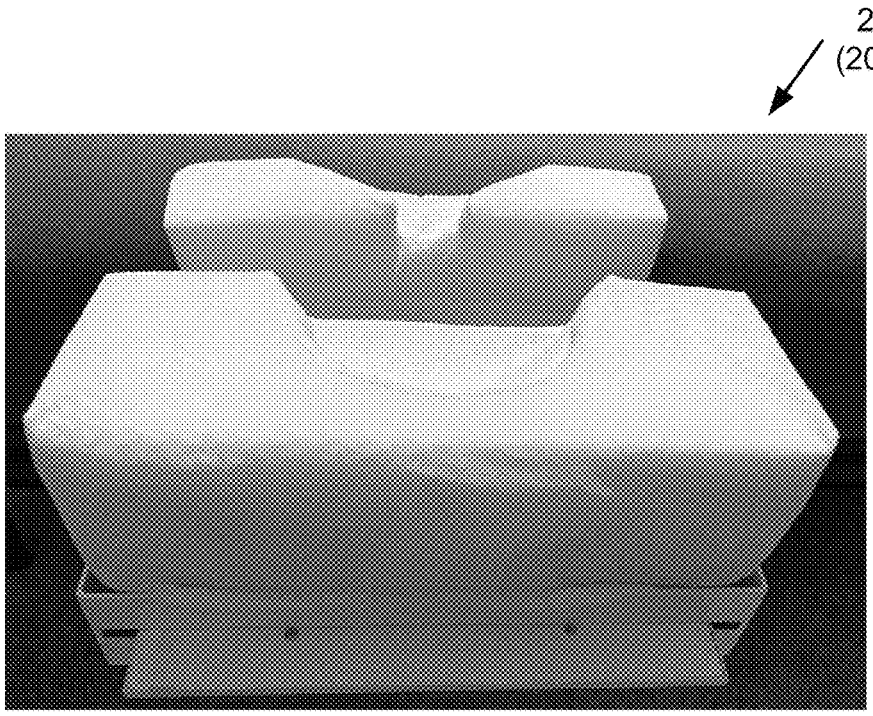


FIG. 9H

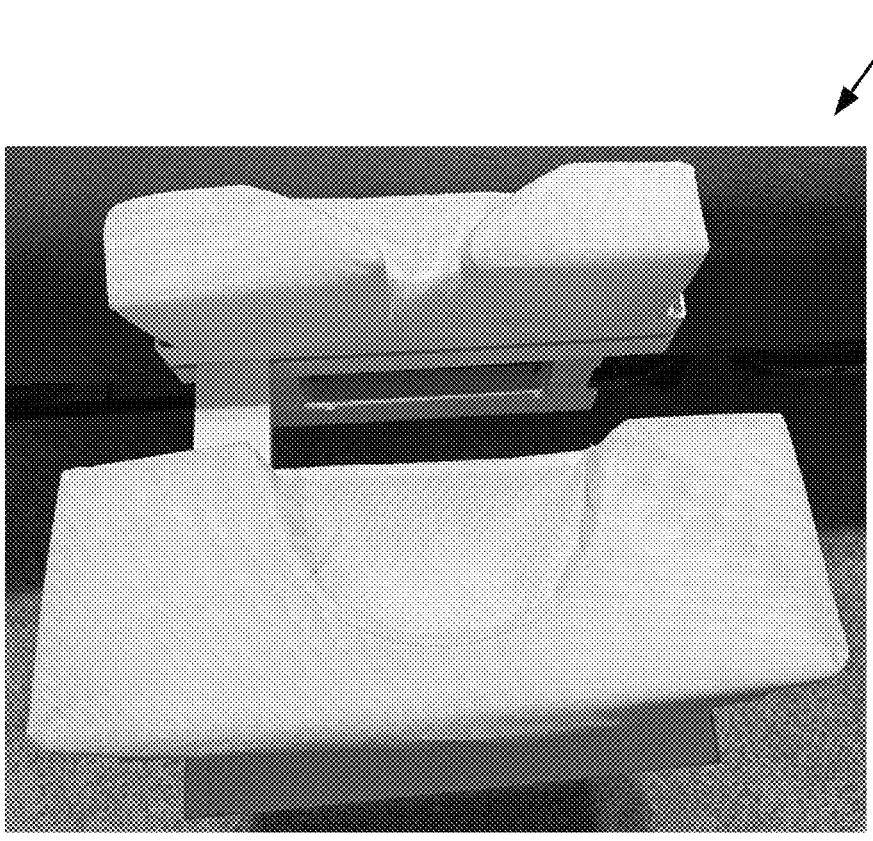


FIG. 9I

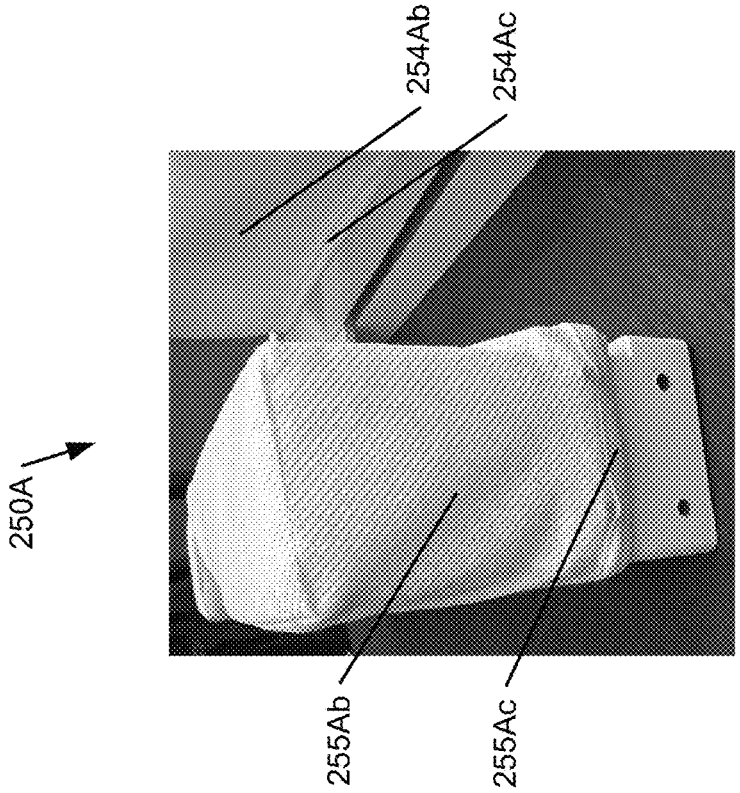


FIG. 9K

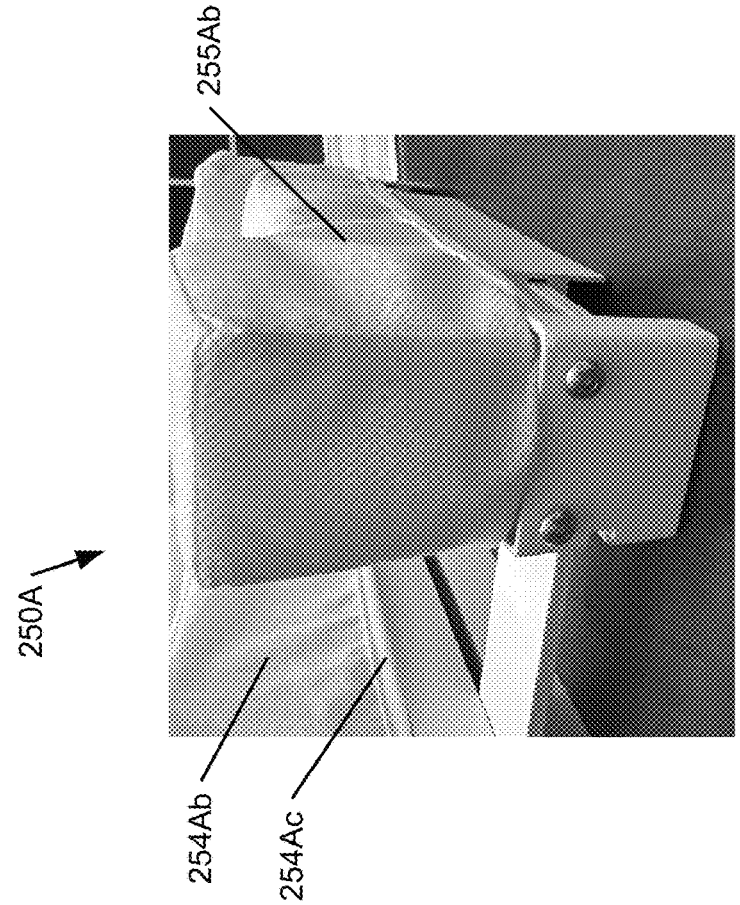
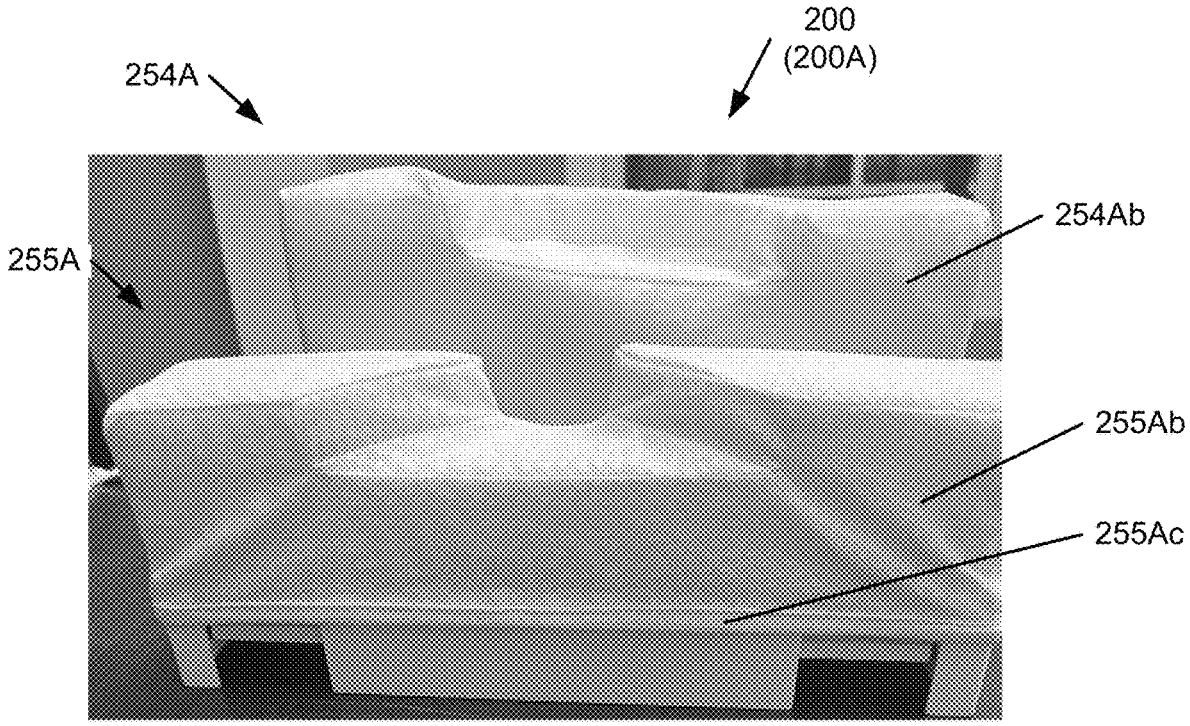


FIG. 9J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254A
254Ab
255A
255Ab
255Ac

FIG. 9L

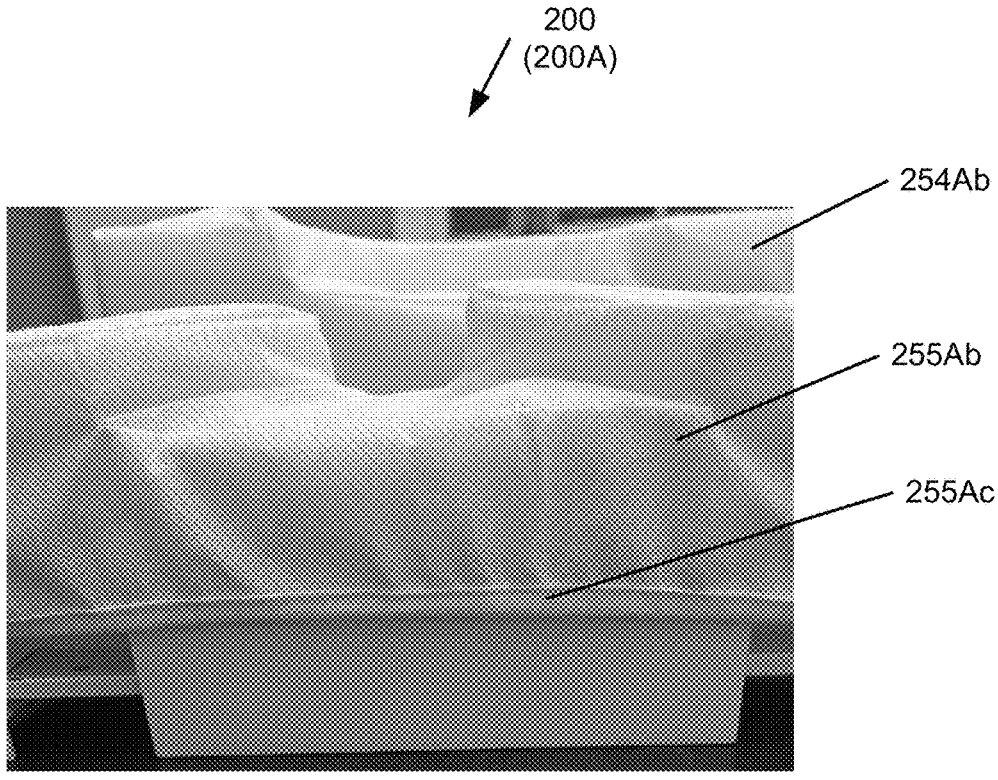

200
(200A)
254Ab
255Ab
255Ac

FIG. 9M

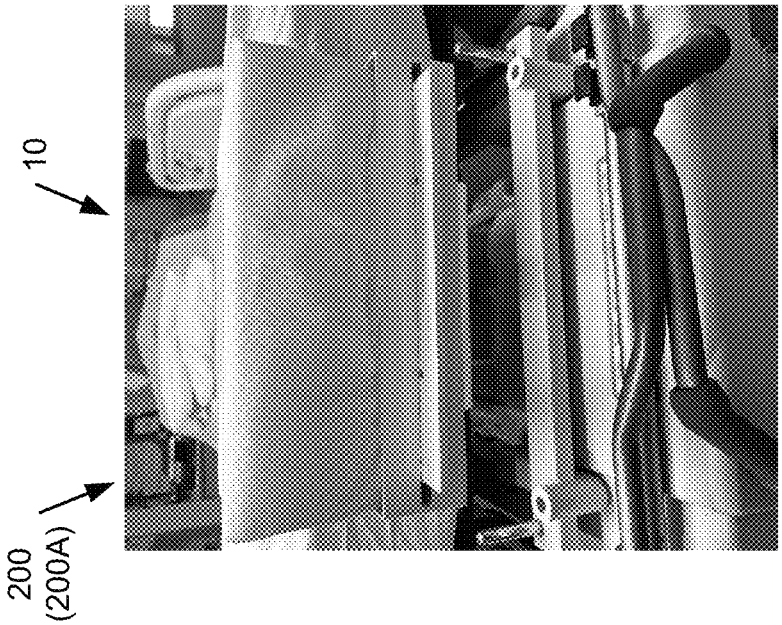


FIG. 10B

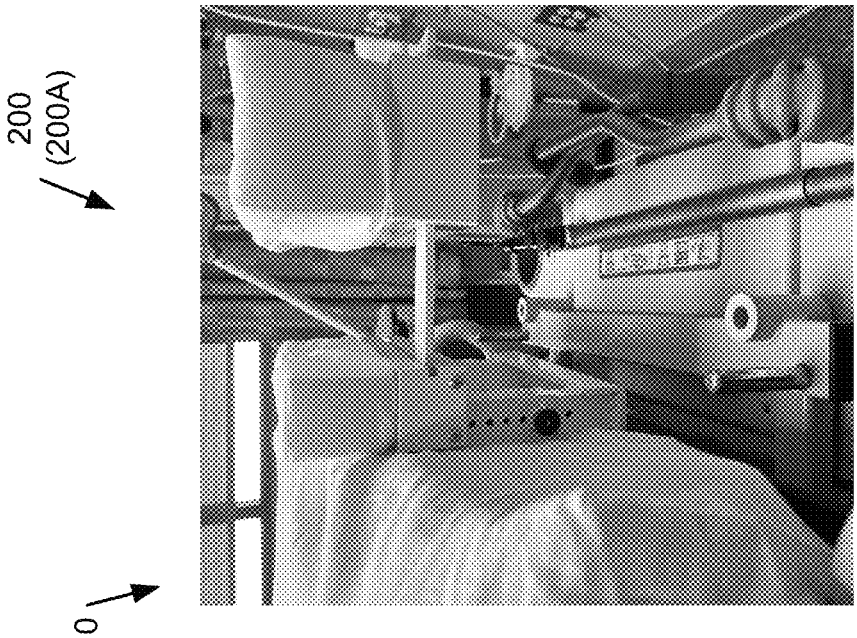


FIG. 10A

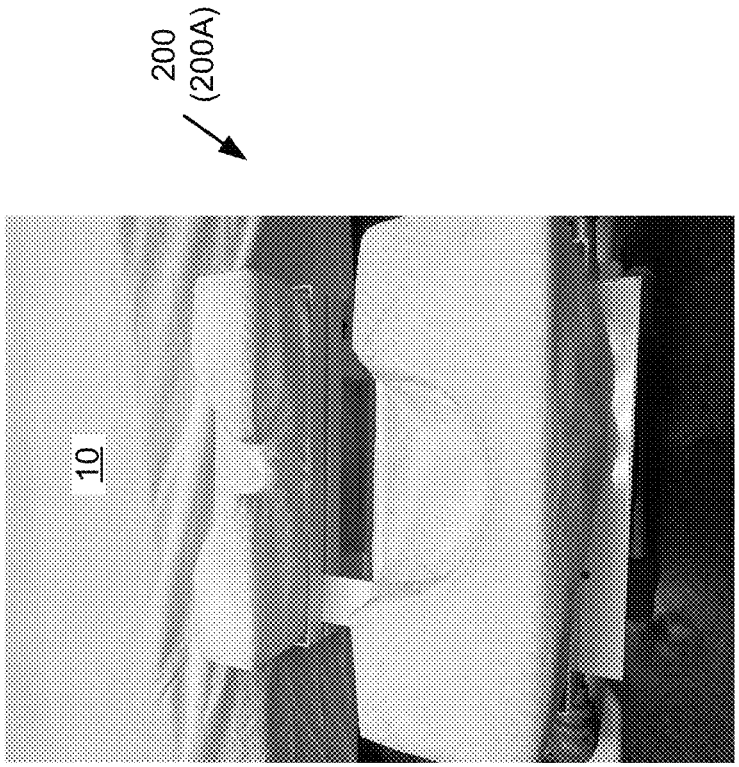


FIG. 10D

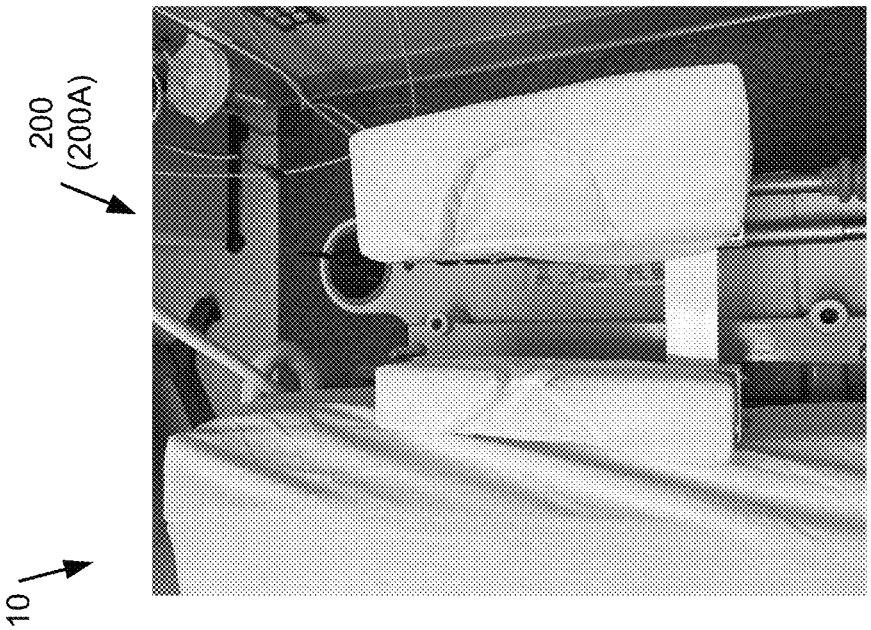


FIG. 10C

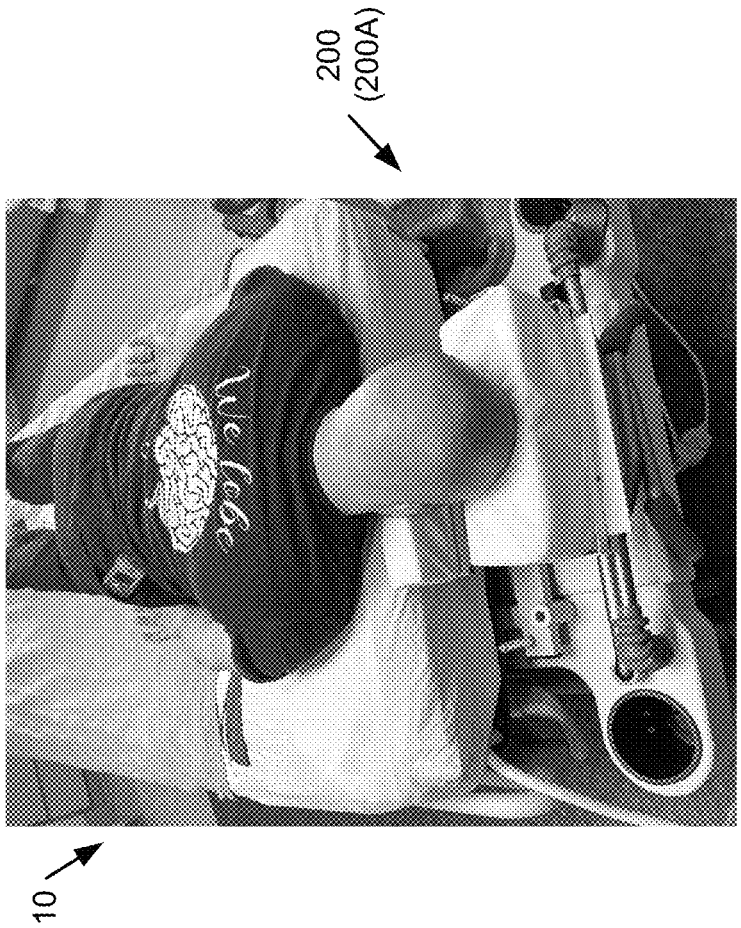


FIG. 10F

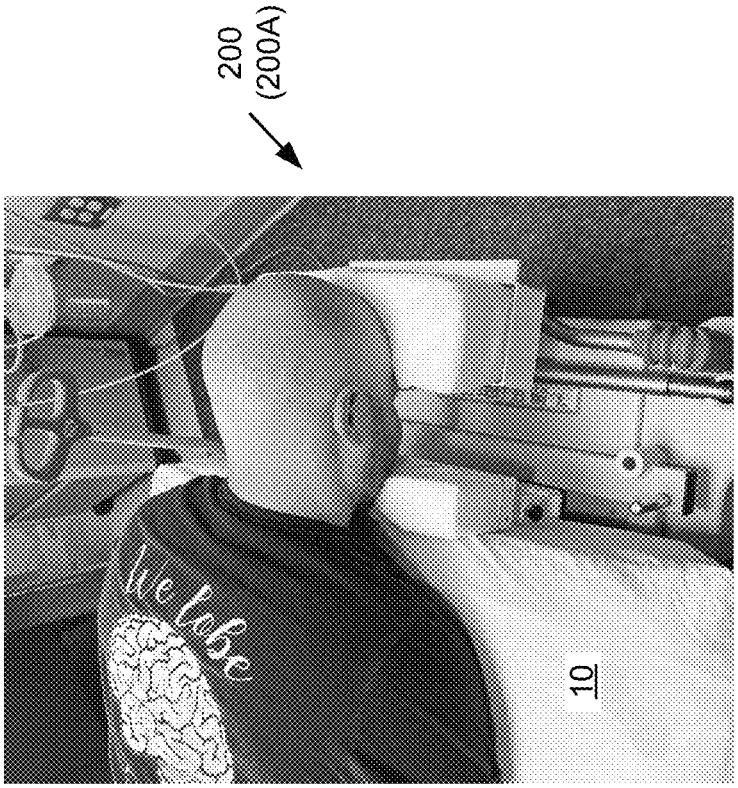


FIG. 10E

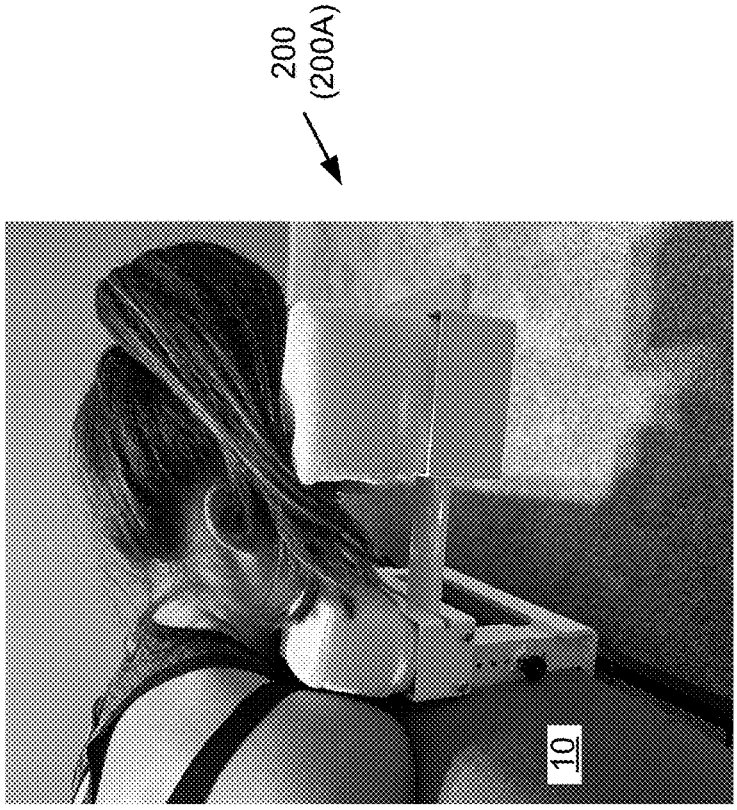


FIG. 10H

FIG. 10G

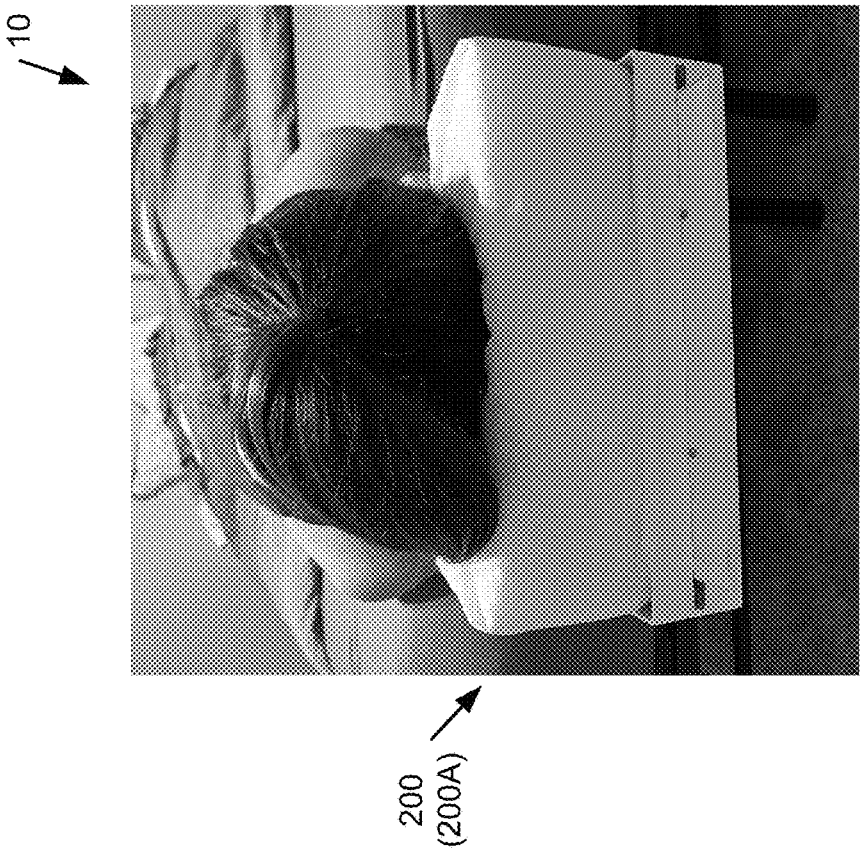


FIG. 10J

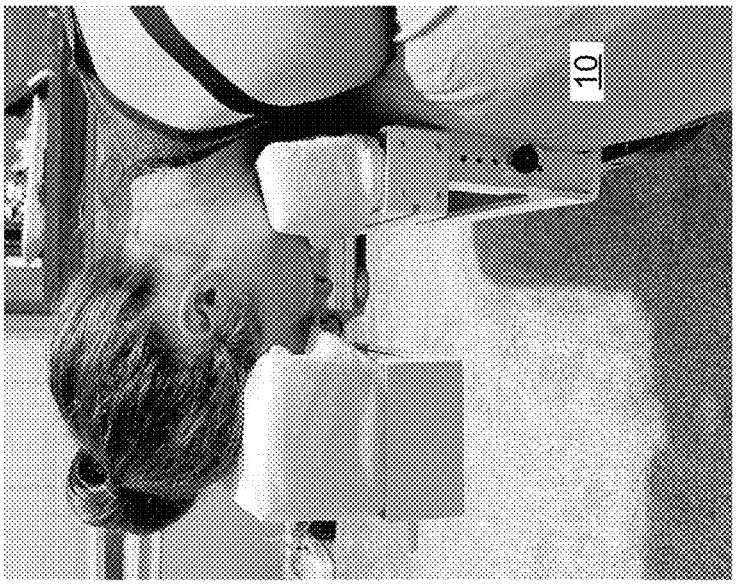


FIG. 10I

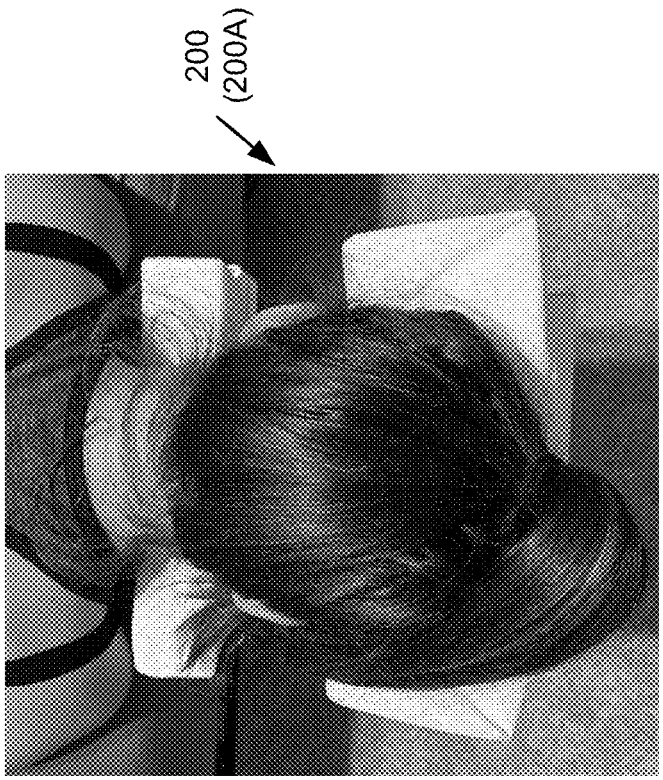


FIG. 10L

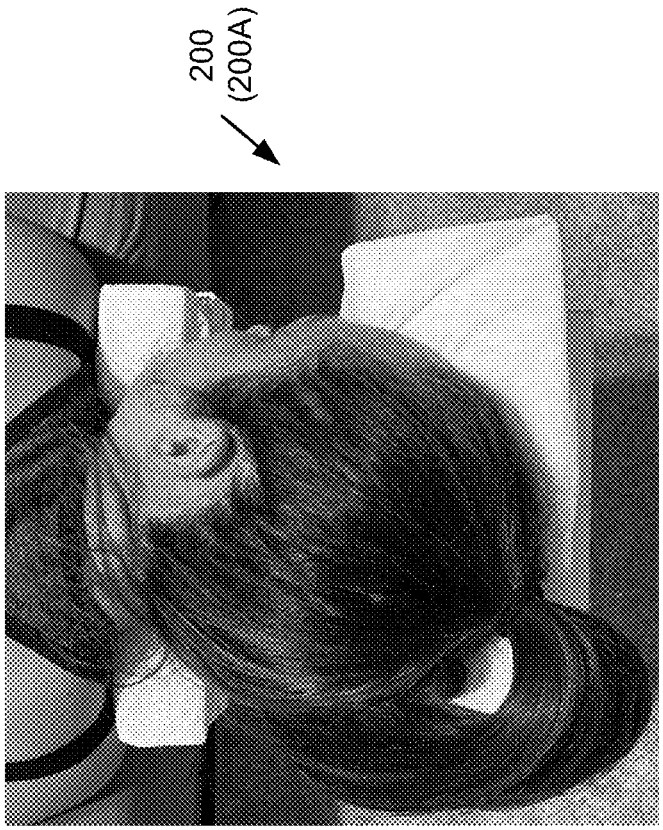


FIG. 10K

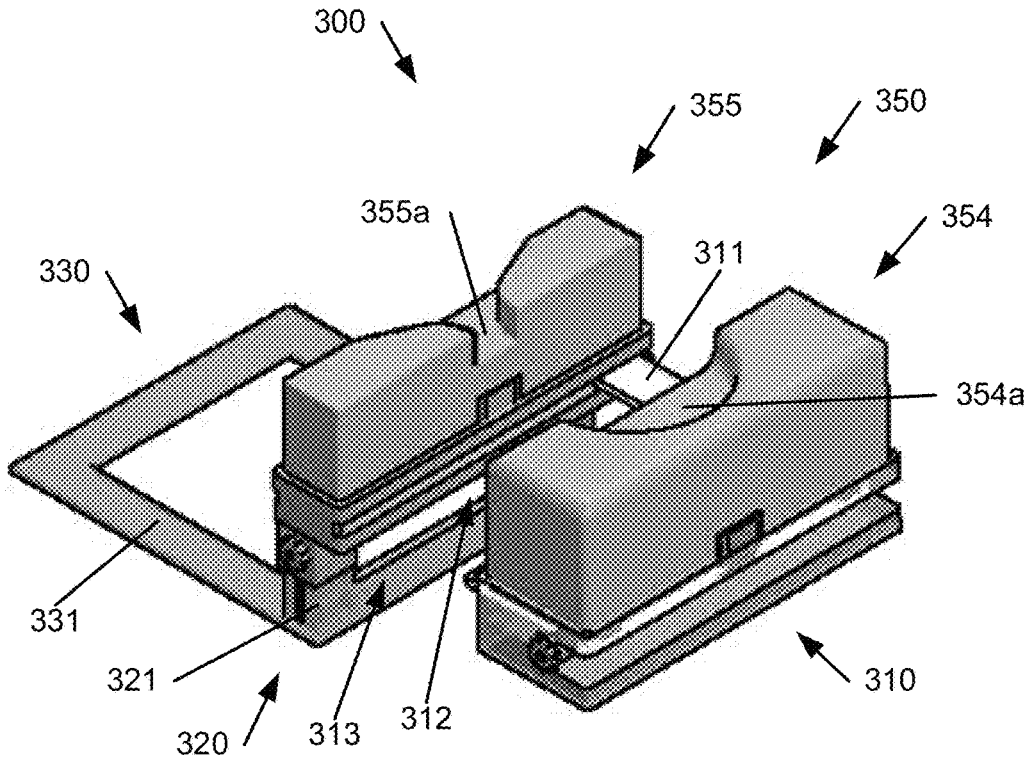


FIG. 11A

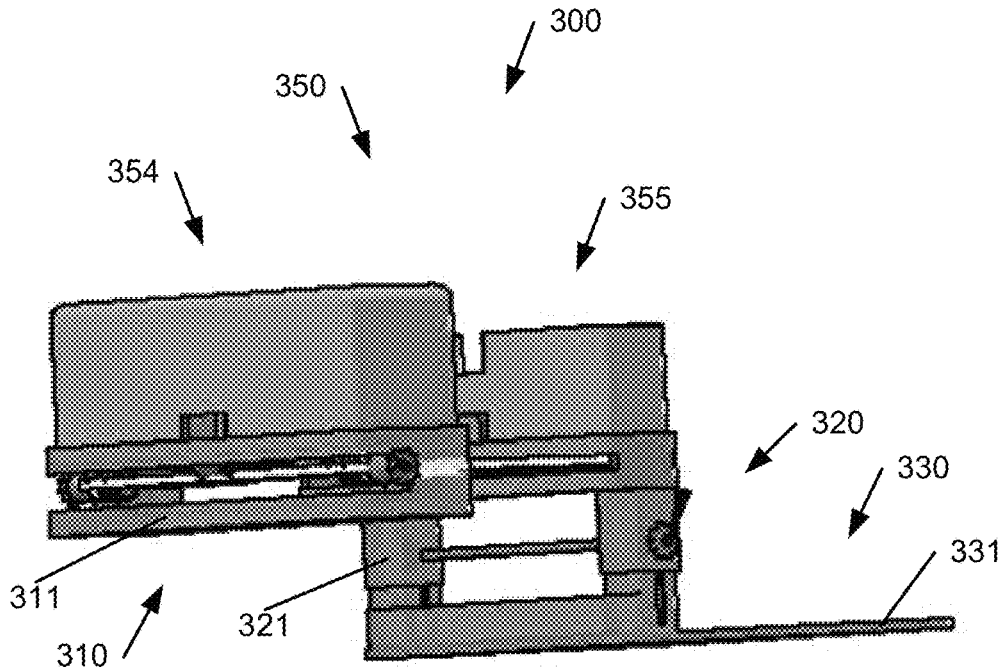
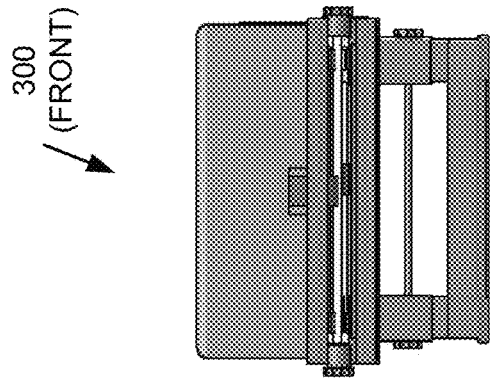
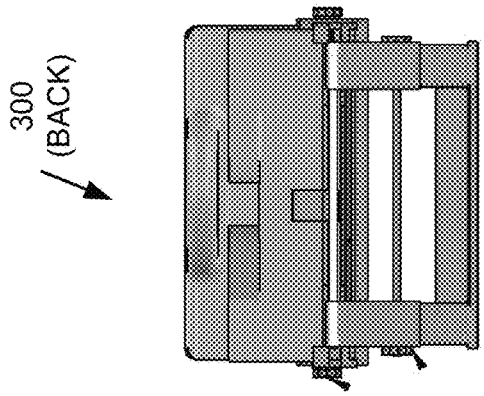
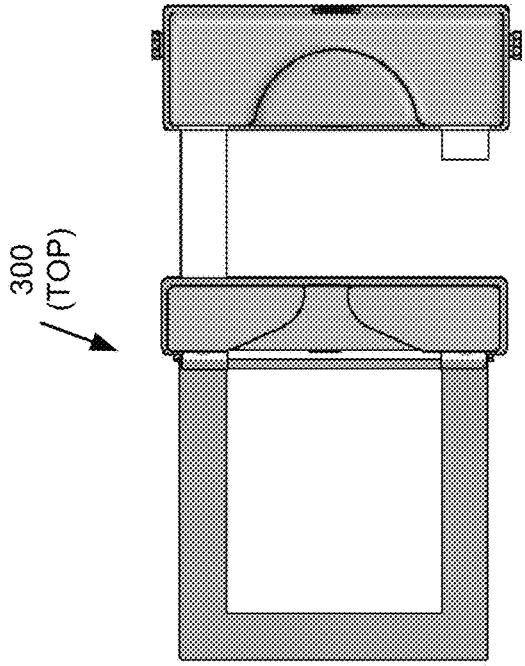


FIG. 11B







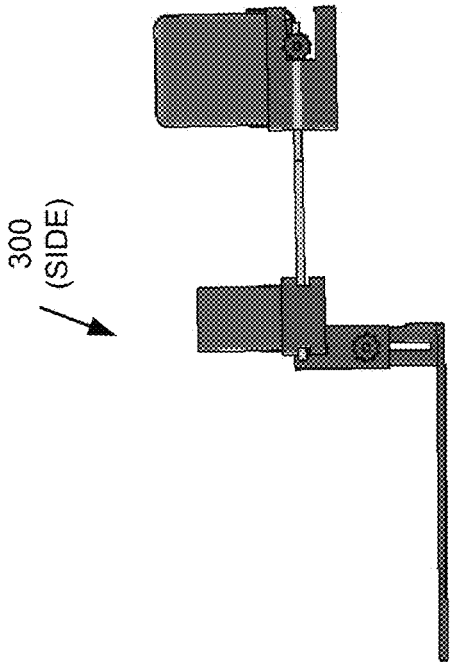


FIG. 11C1

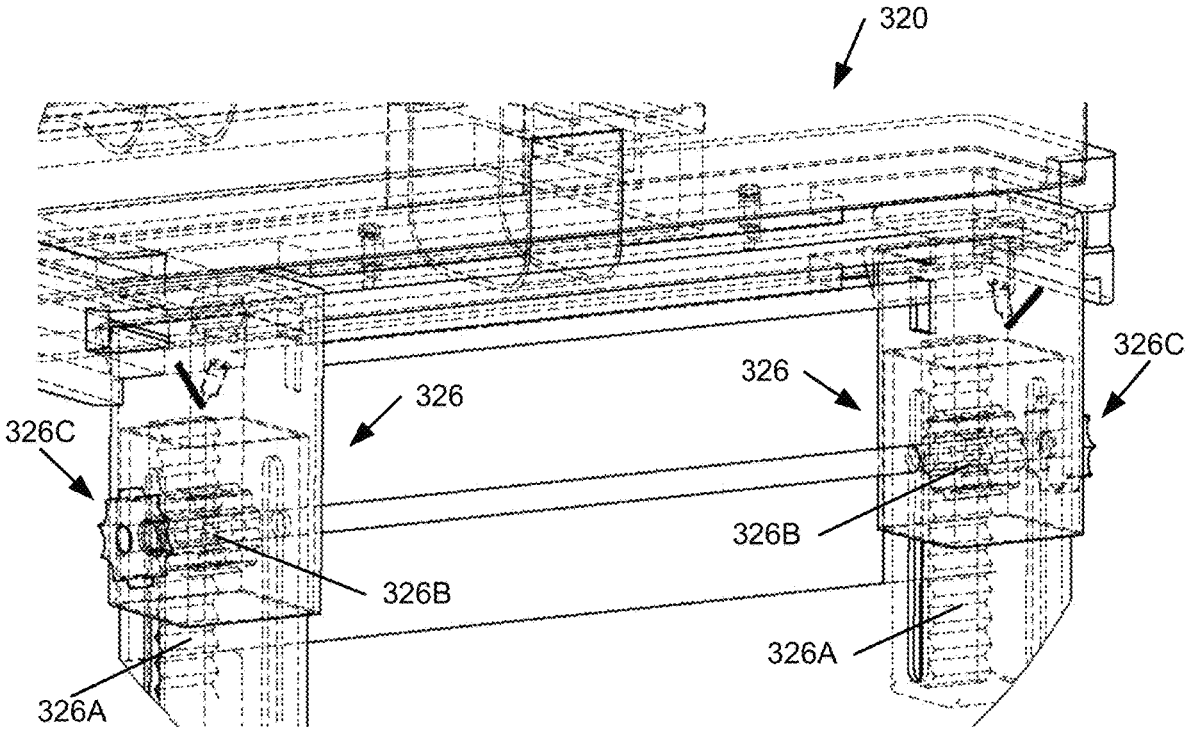


FIG. 11C2

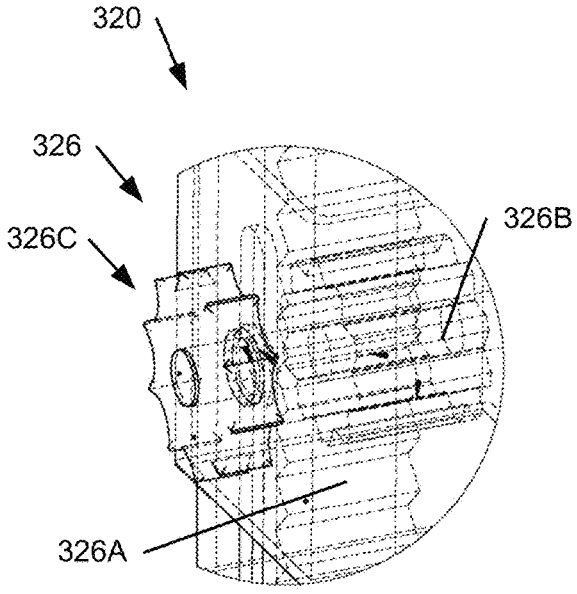


FIG. 11D

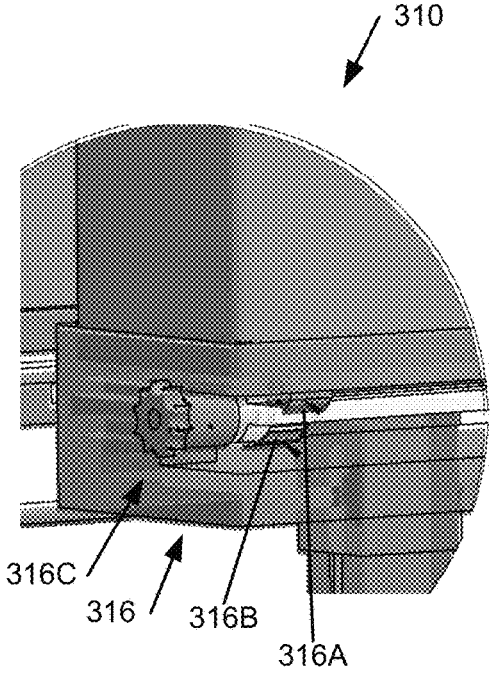


FIG. 11E

HEAD AND NECK CRADLE

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Patent Application Ser. No. 63/221,458, which was filed on Jul. 13, 2021, and is incorporated herein by reference in its entirety.

TECHNICAL FIELD

This disclosure relates to implementations of a head and neck cradle.

BACKGROUND

Proning is the act of placing a patient in a downward facing and/or face-down prone position such as shown in FIG. **1**A. Sometimes, patients are placed in such prone position during mechanical ventilation such as shown in FIG. **1**B. This is referred to as prone ventilation or prone positioning. However, monitoring a patient in the prone position can be difficult. Also, prone positioning can cause facial bruising and endotracheal tube displacement, including accidental extubation, among other problems.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1**A and **1**B illustrates existing examples of proning a medical patient.

FIGS. **2**A-**2**E illustrate an implementation of an example head and neck cradle according to the present disclosure.

FIG. **3** illustrates an example use of the head and neck cradle according to the present disclosure.

FIGS. **4**A-**4**C illustrate another implementation of an example head and neck cradle according to the present disclosure.

FIGS. **5**A-**5**I illustrate another implementation of an example head and neck cradle according to the present disclosure.

FIGS. **6**A-**6**D illustrate another implementation of an example head and neck cradle according to the present disclosure.

FIG. **7** illustrates another implementation of an example head and neck cradle according to the present disclosure.

FIGS. **8**A-**8**G illustrate another implementation of an example head and neck cradle according to the present disclosure.

FIGS. **9**A-**9**M illustrate another implementation of an example head and neck cradle according to the present disclosure.

FIGS. **10**A-**10**L illustrate an example use of the head and neck cradle according to the present disclosure.

FIGS. **11**A-**11**E illustrate another implementation of an example head and neck cradle according to the present disclosure.

DETAILED DESCRIPTION

Implementations of a head and neck cradle are provided. In some implementations, the head and neck cradle comprises an upper platform, a middle platform (or middle portion), and a lower platform.

In some implementations, the head and neck cradle is configured to allow monitoring of a patient in a prone position with less or no difficulty, such as with less or no difficulty seeing and/or accessing the patient's head and/or face.

In some implementations, the head and neck cradle is configured to allow a patient to be kept in a prone position while reducing or preventing facial bruising or similar harm.

In some implementations, the head and neck cradle is configured to allow a patient to be kept in a prone position while reducing or preventing endotracheal tube displacement such as accidental extubation.

In some implementations, the head and neck cradle is configured to allow a patient to be kept in a prone position while reducing or preventing other typical problems from proning.

In some implementations, the head and neck cradle is configured such that the part of the head and neck cradle, such as the lower platform, can be placed under a hospital bed mattress. In some implementations, the head and neck cradle is configured to thereby permit another part of the head and neck cradle, such as the upper platform, to rest adjacent to the end of the hospital bed mattress for resting a patient's head on the head and neck cradle.

In some implementations, the head and neck cradle may be configured to be adjustable for the head size of a patient.

In some implementations, the head and neck cradle may be configured to be adjustable in height.

In some implementations, the head and neck cradle is configured to be portable.

In some implementations, the head and neck cradle is configured to be reusable. For example, in some implementations, one or more components of the head and neck cradle can be cleaned (e.g., disinfected) and reused or can be discarded and replaced to allow the head and neck cradle to be reused multiple times and/or by multiple users.

In some implementations, the head and neck cradle may be configured to be used reversibly. For example, in some implementations, the lower platform and the upper platform can be interchangeably placed under a hospital bed mattress and positioned adjacent to the end of the hospital bed mattress respectively to use the head and neck cradle reversibly.

In some implementations, a method of using the head and neck cradle comprises placing the lower platform under a hospital bed mattress such that the upper platform rests adjacent to the end of the mattress and extends away from the hospital bed. In some implementations, the method comprises placing a patient in a prone position on the hospital bed mattress with the patient's head placed on the upper platform.

FIGS. **2**A-**2**E illustrate an implementation of an example head and neck cradle **100** according to the present disclosure. As shown in FIGS. **2**A and **2**B, in some implementations, the head and neck cradle **100** comprises an upper platform **110**, a middle platform (or middle portion) **120**, and a lower platform **130**.

As shown in FIGS. **2**D and **2**E, in some implementations, the head and neck cradle **100** may further comprise a pad **150**.

As shown in FIG. **2**A, in some implementations, the upper platform **110** comprises a plurality of members **111**. In some implementations, the upper platform **110** comprises an opening **112** through the middle of the upper platform **110** and an opening **113** through a side of the upper platform **110**.

In some implementations, the members **111** may be any suitable size and shape to form the upper platform **110**. For

example, as shown in FIG. **2**A, in some implementations, the members **111** may be generally rectangular prism shaped.

In some implementations, the openings **112**, **113** may be any suitable size and shape. For example, as shown in FIG. **2**A, in some implementations, the openings **112**, **113** may be generally rectangular shaped.

As shown in FIG. **2**A, in some implementations, the upper platform **110** extends in a first direction. In some implementations, the members **111** form the upper platform **110** by extending in a plane in the first direction.

In some implementations, the upper platform **110** may be adjustable such that the size of the middle opening **112** and/or the side opening **113** is adjustable.

As shown in FIG. **2**A, in some implementations, the lower platform **130** comprises a plurality of members **131**. In some implementations, the lower platform **130** comprises an opening **132** through the middle of the lower platform **130**.

In some implementations, the members **131** may be any suitable size and shape to form the upper platform **110**. For example, as shown in FIG. **2**A, in some implementations, the members **131** may be generally rectangular prism shaped.

In some implementations, the opening **132** may be any suitable size and shape. For example, as shown in FIG. **2**A, in some implementations, the opening **132** may be generally rectangular shaped.

As shown in FIG. **2**A, in some implementations, the lower platform **130** extends in a second direction that is opposite to the extending of the upper platform **110** in the first direction. In some implementations, the members **131** form the lower platform **130** by extending in a plane in the second direction.

In some implementations, the lower platform **130** may be adjustable such that the size of the opening **132** is adjustable.

As shown in FIG. **2**A, in some implementations, the middle portion **120** comprises a plurality of members **121**. In some implementations, the middle portion **120** comprises an opening **122** through the middle of the middle portion **120**.

In some implementations, the members **121** may be any suitable size and shape to form the middle portion **120**. For example, as shown in FIG. **2**A, in some implementations, the members **121** may be generally rectangular prism shaped.

In some implementations, the opening **122** may be any suitable size and shape. For example, as shown in FIG. **2**A, in some implementations, the opening **122** may be generally rectangular shaped.

As shown in FIG. **2**A, in some implementations, the middle portion **120** extends in a third direction such that the middle portion **120** connects the upper platform **110** on one side to the lower platform **130** on one side. In some implementations, the members **121** form the middle portion **120** by extending in a plane in the third direction.

In some implementations, the middle portion **120** may be adjustable such that the distance between the upper platform **110** and the lower platform **130** is adjustable.

As shown in FIGS. **2**D and **2**E, in some implementations, the pad **150** comprises an opening **152** through the middle of the pad **150** and an opening **153** extending through a side of the pad **150**.

In some implementations, the pad **150** may be any suitable size and shape. For example, as shown in FIG. **2**E, in some implementations, the pad **150** is dimensioned to be placed on top of the upper platform **110**.

As shown in FIG. **2**E, in some implementations, the openings **152**, **153** through the pad **150** correspond, e.g. in position, size, etc., to the openings **112**, **113** through the upper platform **110**. In this way, in some implementations, when any suitable user (herein, a "patient") places his or her head on the pad **150** positioned on the upper platform **110** in a prone position, such as shown in FIG. **3**, the patient can be observed through the openings **152**, **112**.

Furthermore, in this way, in some implementations, the opening **153**, **113** through the side of the pad **150** and the upper platform **110** respectively helps to position and adjust any tubes (such as for ventilation) and/or other equipment extending from the patient.

In some implementations, the pad **150** may be adjustable such that the size of the middle opening **152** and/or the side opening **153** is adjustable.

As shown in FIGS. **2**A and **2**B, in some implementations, the head and neck cradle **100** is generally Z-shaped. For example, as described above, in some implementations, the upper platform **110** extends in a first direction, the lower platform **130** extends in a second direction generally opposite to the first direction, and the middle portion **120** extends in a third direction from one side of the upper platform **110** to one side of the lower platform **130**.

Furthermore, as shown in FIGS. **2**A and **2**B, in some implementations, the upper platform **110** and the lower platform **130** extend in separate, generally parallel planes, extending in generally opposite directions, and the middle portion **120** extends in a plane generally perpendicular to the planes of the upper platform **110** and the lower platform **130**. In some implementations, when the head and neck cradle **100** is used, the upper platform **110** and the lower platform **130** extend generally horizontal and the middle portion **120** extends generally vertical.

In some implementations, the head and neck cradle **100** may be any suitable shape. In some implementations, the head and neck cradle **100** may be any suitable size.

In some implementations, the upper platform **110**, lower platform **130**, and middle portion **120** may be positioned in any other suitable configuration.

As shown in FIG. **3**, in some implementations, the head and neck cradle **100** is configured such that the lower platform **130** can be placed under any suitable mattress of any suitable bed (herein, a "hospital bed mattress") **10**. In some implementations, the head and neck cradle **100** is configured to thereby permit the upper platform **110** to rest adjacent to the end of the hospital bed mattress **10** for resting a patient's head on the upper platform **110**.

In this way, in some implementations, a portion of a patient's face and any equipment extending from the patient's face can be positioned through the openings **112**, **113** of the upper platform **110** when using the head and neck cradle **100**. Furthermore, in some implementations, a portion of the patient's face and any equipment extending from the patient's face can be positioned through the openings **152**, **153** of the pad **150** when included on the head and neck cradle **100**.

In some implementations, the head and neck cradle **100** is configured to allow monitoring of a patient in a prone position with less or no difficulty, such as with less or no difficulty seeing and/or accessing the patient's head and/or face.

In some implementations, the head and neck cradle **100** is configured to allow a patient to be kept in a prone position while reducing or preventing facial bruising or similar harm.

In some implementations, the head and neck cradle **100** is configured to allow a patient to be kept in a prone position while reducing or preventing endotracheal tube displacement such as accidental extubation.

In some implementations, the head and neck cradle **100** is configured to allow a patient to be kept in a prone position while reducing or preventing other typical problems from proning.

In some implementations, the head and neck cradle **100** is configured to be used as an off-the-bed head cradle.

In some implementations, the head and neck cradle **100** is configured to be portable.

In some implementations, the head and neck cradle **100** is configured to be reusable. For example, in some implementations, one or more components of the head and neck cradle **100**, such as the upper platform **110**, can be cleaned (e.g., disinfected) and reused to allow the head and neck cradle **100** to be reused multiple times and/or by multiple users.

In some implementations, one or more components of the head and neck cradle **100**, such as the pad **150**, can be discarded and replaced to allow the head and neck cradle **100** to be reused multiple times and/or by multiple users.

In some implementations, the head and neck cradle **100** may be configured to be reversible. For example, as shown in FIGS. **4**A and **5**A, in some implementations, the lower platform **130** and the upper platform **110** are configured to be interchangeably placed under a hospital bed mattress and positioned adjacent to the end of the hospital bed mattress respectively to use the head and neck cradle **100** reversibly.

In some implementations, the head and neck cradle **100** may be configured to include a pad **150** or similar padding, such as shown in FIGS. **2**E and **6**A-**6**D. In some implementations, the head and neck cradle **100** may be configured to be used without a pad **150** (cushion, pillow) or similar or other padding or cushioning, such as shown in FIGS. **2**A, **4**A, and **5**A.

In some implementations, the head and neck cradle **100** may be configured to include a member **111**, **131** adjacent to the middle portion **120** that provides additional horizontal head support, such as shown in FIGS. **4**A and **5**A. In some implementations, the head and neck cradle **100** may be configured to not include an additional horizontal head support member **111**, **131** adjacent to the middle portion **120**, such as shown in FIG. **2**A.

In some implementations, the head and neck cradle **100** may be configured to be adjustable for the head size of a patient. For example, in some implementations, the position of one or more of the members **111**, **131** and/or the pad **150** may be adjustable, such as shown in FIGS. **5**F and **6**D.

In some implementations, the head and neck cradle **100** may be configured to be adjustable in height. For example, in some implementations, length of the middle portion **120** between the upper platform **110** and the lower platform **130** may be adjustable, such as shown in FIGS. **5**A, **5**B, **5**D, and **5**E.

FIGS. **4**A-**4**C illustrate another implementation of an example head and neck cradle **100** (**100**A) according to the present disclosure. In some implementations, the head and neck cradle **100**A is the same or similar to the head and neck cradle **100** described above for FIGS. **2**A-**2**E and **3**, except as described below.

For example, as shown in FIG. **4**A, in some implementations, the head and neck cradle **100**A comprises an upper platform **110**A, a middle platform (or middle portion) **120**A, and a lower platform **130**A that are generally the same or similar respectively to the above-described upper platform **110**, middle platform (or middle portion) **120**, and lower platform **130** of the head and neck cradle **100** of FIGS. **2**A-**2**E.

As shown in FIG. **4**A, in some implementations, the lower platform **130**A of the head and neck cradle **100**A further comprises an opening **133**A through a side of the lower platform **130**A that is the same or similar to the above-described opening **113** through a side of the upper platform **110** of the head and neck cradle **100**. In this way, in some implementations, the head and neck cradle **100**A is configured to be reversible such that the upper platform **110**A and the lower platform **130**A can be used reversibly.

As shown in FIG. **4**A, in some implementations, the head and neck cradle **100**A further comprises a member **111**A, **131**A adjacent to the middle portion **120**A. In this way, in some implementations, the head and neck cradle **100**A is configured to provide additional horizontal head support by the upper platform **110**A or the lower platform **130**A.

FIGS. **5**A-**5**I illustrate another implementation of an example head and neck cradle **100** (**100**B) according to the present disclosure. In some implementations, the head and neck cradle **100**B is the same or similar to the head and neck cradle **100**A described above for FIGS. **4**A-**4**C, except as described below.

For example, as shown in FIG. **5**A, in some implementations, the head and neck cradle **100**B comprises an upper platform **110**B, a middle platform (or middle portion) **120**B, and a lower platform **130**B that are generally the same or similar respectively to the above-described upper platform **110**A, middle platform (or middle portion) **120**A, and lower platform **130**A of the head and neck cradle **100**A of FIGS. **4**A-**4**C.

As shown in FIGS. **5**A, **5**B, **5**D, and **5**E, in some implementations, the head and neck cradle **100**B is further configured to be adjustable in height by the length of the middle portion **120**B between the upper platform **110**B and the lower platform **130**B being adjustable. For example, in some implementations, the middle portion **120**B further comprises a plurality of adjustment openings **124**B that allow the length adjustment of the middle portion **120**B.

In some implementations, the adjustment openings **124**B may be any suitable size. In some implementations, the adjustment openings **124**B may be any suitable shape.

In some implementations, the adjustment openings **124**B may be positioned in any suitable configuration to allow the length adjustment of the middle portion **120**B.

In some implementations, the adjustment openings **124**B are configured to engage with any suitable component to allow the length adjustment of the middle portion **120**B. For example, in some implementations, the adjustment openings **124**B may be configured to receive a bolt, screw, or other suitable fastener.

In some implementations, the head and neck cradle **100**B may comprise any other suitable features that allow the length adjustment of the middle portion **120**B for the height adjustment of the head and neck cradle **100**B.

As shown in FIG. **5**F, in some implementations, the head and neck cradle **100**B is further configured to be adjustable for the head size of a patient by the position of one or more of the members **111**B, **131**B being adjustable. For example, in some implementations, the upper platform **110**B and the lower platform **130**B further comprise a plurality of adjustment slots **115**B, **135**B respectively that allow the size of the respective middle opening **112**B, **132**B to be adjusted.

In some implementations, the adjustment slots **115**B, **135**B may be any suitable size. In some implementations, the adjustment slots **115**B, **135**B may be any suitable shape.

In some implementations, the adjustment slots **115**B, **135**B may be positioned in any suitable configuration to allow the size adjustment of the respective middle opening **112**B, **132**B.

In some implementations, the adjustment slots **115**B, **135**B are configured to engage with any suitable component to allow the length adjustment of the middle portion **120**B. For example, in some implementations, the adjustment slots **115**B, **135**B may be configured to receive a bolt, screw, or other suitable fastener.

In some implementations, the adjustment slots **115**B, **135**B may further or alternately be configured to allow the position adjustment of the above described pad **150** for the size adjustment of the respective middle opening **112**B, **132**B, such as described below for FIG. **6**D.

In some implementations, the head and neck cradle **100**B may comprise any other suitable features that allow the position adjustment of the members **111**B, **131**B respectively for the size adjustment of the middle opening **112**B, **132**B.

FIGS. **6**A-**6**D illustrate another implementation of an example head and neck cradle **100** (**100**C) according to the present disclosure. In some implementations, the head and neck cradle **100**C is the same or similar to the head and neck cradle **100**B described above for FIGS. **5**A-**5**I, except as described below.

For example, as shown in FIGS. **6**A and **6**B, in some implementations, the head and neck cradle **100**C comprises an upper platform **110**C, a middle platform (or middle portion) **120**C, and a lower platform **130**C that are generally the same or similar respectively to the above-described upper platform **110**B, middle platform (or middle portion) **120**B, and lower platform **130**B of the head and neck cradle **100**B of FIGS. **5**A-**5**I.

As shown in FIGS. **6**B and **6**D, in some implementations, the head and neck cradle **100**C also comprises adjustment openings **124**C and adjustment slots **115**C, **135**C that are the same or similar respectively to the above-described adjustment openings **124**B and adjustment slots **115**B, **135**B of the head and neck cradle **100**B of FIGS. **5**A-**5**I.

As shown in FIGS. **6**A and **6**B, in some implementations, the head and neck cradle **100**C further comprises a pad **150**C that is generally similar to the pad **150** described above for FIGS. **2**D and **2**E. In some implementations, the pad **150**C may comprise two or more pieces.

As shown in FIG. **6**B, in some implementations, one piece of the pad **150**C is connected to one or more members **111**C of the upper platform **110**C and another piece of the pad **150**C is connected to one or more other members **111**C of the upper platform **110**C. In this way, in some implementations, the pieces of the pad **150**C can be repositioned to adjust the size of the pad middle opening **152** for the head size of a patient.

As shown in FIG. **6**A, in some implementations, the pad **150**C is sized and shaped to receive and support a patient's head. For example, in some implementations, the pad **150**C comprises a varying size and shape that allows the pad **150**C to comfortably receive and support a patient's head.

In some implementations, the pad **150**C is further configured (e.g., sized, shaped, and/or composed) to relieve pressure on the forehead, chin, etc. of a patient while using the head and neck cradle **100**C.

As shown in FIG. **6**D, in some implementations, the adjustment slots **115**C, **135**C are configured to allow the attachment of the pad **150**C to the platform **110**C, **130**C, such as by a bolt, screw, or other suitable fastener. In some implementations, the adjustment slots **115**C, **135**C are configured to allow the pad **150**C to be movably attached to the platform **110**C, **130**C.

As shown in FIG. **6**D, in some implementations, the adjustment slots **115**C, **135**C are configured to allow the position adjustment of the pad **150**C such that the size of the pad middle opening **152** can be adjusted for the head size of a patient. For example, in some implementations, the adjustment slots **115**C, **135**C allow the attached pieces of the pad **150**C to be moved together or apart.

FIG. **7** illustrates another implementation of an example head and neck cradle **100** (**100**D) according to the present disclosure. In some implementations, the head and neck cradle **100**D is the same or similar to the head and neck cradle **100** described above for FIGS. **2**A-**2**E and **3**, except as described below.

For example, as shown in FIG. **7**, in some implementations, the head and neck cradle **100**D comprises an upper platform **110**D, a middle platform (or middle portion) **120**D, and a lower platform **130**D that are generally the same or similar respectively to the above-described upper platform **110**, middle platform (or middle portion) **120**, and lower platform **130** of the head and neck cradle **100** of FIGS. **2**A-**2**E.

In some implementations, the middle portion **120**D of the head and neck cradle **100**D further comprises a linear bearing, shaft, and block assembly **160**D that is configured such that the height-length of the middle portion **120**D between the upper platform **110**D and the lower platform **130**D is adjustable similar to the middle portion **120**B of the head and neck cradle **100**B of FIGS. **5**A-**5**I.

As shown in FIG. **7**, in some implementations, the assembly **160**D comprises a block **161**D, one or more linear bearings **162**D, one or more shafts **163**D, one or more shaft locks **164**D, and a shaft assembly (or shaft platform) **165**D.

In some implementations, the block **161**D is configured to retractably receive the linear bearing **162**D and shaft **163**D and to connect the assembly **160**D to the lower platform **130**D. In some implementations, the block **161**D may comprise any suitable block, such as a machined block of delrin or aluminum, or other suitable component.

In some implementations, the linear bearings **162**D are configured to guide and support the shaft platform **165**D and to extend and retract from the block **161**D to allow the height-length adjustment of the middle portion **120**D. In some implementations, the linear bearings **162**D may comprise any suitable linear bearing or other suitable component.

In some implementations, the shaft **163**D is configured to extend and retract from the block **161**D and to control the positioning of the shaft platform **165**D to allow the height-length adjustment of the middle portion **120**D. In some implementations, the shaft **163**D may comprise a spring or spring mechanism configured to assist with extending and/or retracting the shaft **163**D.

In some implementations, the shaft **163**D may comprise any suitable shaft or other suitable component.

In some implementations, the shaft lock **164**D is configured to secure the shaft **163**D at any suitable extension from the block **161**D to secure the positioning of the shaft platform **165**D to allow the height-length adjustment of the middle portion **120**D. In some implementations, the shaft lock **164**D may comprise any suitable shaft lock or other suitable component.

In some implementations, the shaft platform **165**D is configured to connect the assembly **160**D to the upper platform **110**D and to allow the height-length adjustment of the middle portion **120**D. In some implementations, the shaft platform **165**D may comprise any suitable shaft platform or other suitable component.

FIGS. **8**A-**8**G illustrate another implementation of an example head and neck cradle **200** according to the present

disclosure. In some implementations, the head and neck cradle **200** is the same or similar to the head and neck cradle **100**C described above for FIGS. **6**A-**6**D, except as described below.

For example, as shown in FIGS. **8**A and **8**B, in some implementations, the head and neck cradle **200** comprises an upper platform **210**, a middle platform (or middle portion) **220**, a lower platform **230**, and a pad **250** that are generally the same or similar respectively to the above-described upper platform **110**C, middle platform (or middle portion) **120**C, lower platform **130**C, and pad **150**C of the head and neck cradle **100**C of FIGS. **6**A-**6**D.

In some implementations, the upper platform **210** of the head and neck cradle **200** is further configured to be flipped over to reposition the side opening **213** from one side of the upper platform **210** to the other, such as shown in FIGS. **8**A, **8**B, **8**E, and **8**F. For example, in some implementations, the upper platform **210** is configured to be detached from the middle portion **220**, flipped (or turned) over to the other (or opposite) side, and reattached to the middle portion **220** such that the side opening **213** is moved from one side of the upper platform **210** to the other.

As shown in FIGS. **8**E-**8**G, in some implementations, the upper platform **210** is further configured to allow the pad **250** to attach to either side of the upper platform **210**, such as when the upper platform **210** is flipped over.

As shown in FIG. **8**D, in some implementations, the members **231** of the lower platform **230** may be further configured to form a four-sided square or rectangular shaped platform.

As shown in FIGS. **8**A and **8**B, in some implementations, the pad **250** further comprises a head pad **254** and a chin/neck pad **255** configured to separately attach to the upper platform **210**. For example, in some implementations, the pads **254**, **255** are configured to attach to opposite positioned members **231** of the upper platform **210** such that a patient's face between the patient's neck and forehead can position within the opening **212** of the upper platform **210** and adjacent to the side opening **213**, such as shown in FIGS. **10**E-**10**L (described below).

In some implementations, the head pad **254** is configured to support a patient's head and/or forehead, such as shown in FIGS. **10**E-**10**L (described below), and/or any other suitable part of the patient.

In some implementations, the chin/neck pad **255** is configured to support a patient's chin (such as shown in FIGS. **10**E and **10**F), a patient's neck (such as shown in FIGS. **10**G-**10**I, **10**K, and **10**L), and/or any other suitable part of the patient.

In some implementations, the pad **250** is further configured to attach and detach from the upper platform **210** by any suitable attachment means, such as a hook and loop fastener, snap fastener, etc.

As shown in FIGS. **8**A and **8**B, in some implementations, the pad **250** further comprises cutout portions **254***a*, **255***a* that are configured to comfortably receive a portion of a patient's head and chin/neck (i.e., chin and/or neck) respectively.

As shown in FIG. **8**D, in some implementations, the pad **250** may further comprise pad covers **254***b*, **255***b*. In some implementations, the pad covers **254***b*, **255***b* are a removable and/or replaceable pad cover for a patient's head and chin/neck to position on, such as for sanitary, comfort, etc, purposes.

In some implementations, the covers **254***b*, **255***b* are configured to be moisture wicking. In some implementations, the covers **254***b*, **255***b* are configured to be form-fitting to the pads **254** **255**, such as similar to a fitted sheet. For example, as shown in FIGS. **9**J-**9**M (described below), in some implementations, the covers **254***b*, **255***b* comprise fitting support **254***c*, **255***c*, such as an elastic band and/or similar fit-supporting components.

FIGS. **9**A-**9**M illustrate another implementation of an example head and neck cradle **200** (**200**A) according to the present disclosure. In some implementations, the head and neck cradle **200**A is the same or similar to the head and neck cradle **200** described above for FIGS. **8**A-**8**G.

For example, as shown in FIGS. **9**E and **9**F, in some implementations, the head and neck cradle **200**A comprises an upper platform **210**A, a middle platform (or middle portion) **220**A, a lower platform **230**A, and a pad **250**A that are generally the same or similar respectively to the above-described upper platform **210**, middle platform (or middle portion) **220**, lower platform **230**, and pad **250** of the head and neck cradle **200** of FIGS. **8**A-**8**G.

FIGS. **10**A-**10**L illustrate an example use of the head and neck cradle **200** (**200**A) according to the present disclosure. In some implementations, the use of the head and neck cradle **200**A shown in FIGS. **10**A-**10**L is the same or similar to the use of the head and neck cradle **100** described above for FIG. **3**.

For example, as shown in FIGS. **10**A-**10**D, in some implementations, the head and neck cradle **200**A is configured such that the lower platform **230**A can be placed under any suitable mattress of any suitable bed (herein, a "hospital bed mattress") **10**. In some implementations, the head and neck cradle **200**A is configured to thereby permit the upper platform **210**A to rest adjacent to the end of the hospital bed mattress **10** for resting a patient's head on the upper platform **210**A.

In this way, as shown in FIGS. **10**E-**10**L, in some implementations, a portion of a patient's face and any equipment extending from the patient's face can be positioned through the openings **212**A, **213**A of the upper platform **210**A when using the head and neck cradle **200**A. Furthermore, in some implementations, a portion of the patient's face and any equipment extending from the patient's face can be positioned adjacent to the pad **250**A, such as between the head pad **254**A and the chin/neck pad **255**A.

FIGS. **11**A-**11**E illustrate another implementation of an example head and neck cradle **300** according to the present disclosure. In some implementations, the head and neck cradle **300** is the same or similar to the head and neck cradle **100**C described above for FIGS. **6**A-**6**D, except as described below.

For example, as shown in FIGS. **11**A and **11**B, in some implementations, the head and neck cradle **300** comprises an upper platform **310**, a middle platform (or middle portion) **320**, a lower platform **330**, and a pad **350** that are generally the same or similar respectively to the above-described upper platform **110**C, middle platform (or middle portion) **120**C, lower platform **130**C, and pad **150**C of the head and neck cradle **100**C of FIGS. **6**A-**6**D.

As shown in FIGS. **11**C-**11**E, in some implementations, the middle portion **320** and/or the upper platform **310** further comprise rack and pinion geared adjustment mechanisms **326**, **316**. That, in some implementations, the middle portion **320** and/or the upper platform **310** further comprise adjustment mechanisms **326**, **316** that comprise rack (or linear) **326***a*, **316***a* and pinion (or circular) **326***b*, **316***b* gear engagements to translate circular motion to linear motion.

As shown in FIGS. **11**C-**11**E, in some implementations, the middle portion **320** and/or the upper platform **310** further comprise adjustment handles or knobs **326***c*, **316***c* that are

attached to the pinion gears **326***b*, **316***b*. In some implementations, the handles **326***c*, **316***c* are configured to allow a user to turn or rotate the pinion gears **326***b*, **316***b* by turning or rotating the handles **326***c*, **316***c*. In this way, in some implementations, the rack gears **326***c*, **316***c* can be moved linearly by turning or rotating the handles **326***c*, **316***c*.

As shown in FIGS. **11**C-**11**E, in some implementations, the rack gears **326***c*, **316***c* are attached to the middle portion **320** and/or the upper platform **310** respectively. In some implementations, the rack gears **326***c*, **316***c* are attached such that the linear movement of the rack gears **326***c*, **316***c* causes the adjusting movement of the middle portion **320** and/or the upper platform **310** respectively. In some implementations, the adjusting movement may be vertical, horizontal, and/or any other suitable direction.

For example, in some implementations, the middle portion adjustment mechanism **326** is configured to vertically adjust the height or length of the middle portion **320** when the handle **326***c* is turned. In some implementations, the upper platform adjustment mechanism **316** is configured to horizontally adjust the length or position of the upper platform **310**, such as the position of the head pad **354** and/or the chin/neck pad **355**, when the handle **316***c* is turned.

In some implementations, the **326**, **316** are configured to allow adjustment of the platforms **320**, **310** while a patient is positioned on the head and neck cradle **300**.

One skilled in the art will understand the use of rack and pinion gear engagements for the adjustment mechanisms **326**, **316** in light of the disclosure herein.

As shown in FIG. **11**C, in some implementations, the members **331** of the lower platform **330** may be further configured to form a four-sided square or rectangular shaped platform.

As shown in FIGS. **11**A and **11**B, in some implementations, the pad **350** is the same or similar to the pad **250** of the head and neck cradle **200** described above for FIGS. **8**A-**8**G, as indicated by like-numbered and/or like-named features. For example, in some implementations, the pad **350** comprises a head pad **354** and a chin/neck pad **355** configured to separately attach to the upper platform **310**. In some implementations, the pad **350** further comprises cutout portions **354***a*, **355***a* configured to comfortably receive a portion of a patient's head and neck respectively.

In some implementations, the pad **350** may further comprise pad covers for a patient's head and neck to position on, such as for sanitary, comfort, etc, purposes.

In some implementations, the head and neck cradle **100**, **200**, **300** comprises any suitable dimensions, such as the example dimensions show in the figures.

In some implementations, the head and neck cradle **100**, **200**, **300** is composed of any suitable materials. For example, in some implementations, the members **111**, **211**, **311**, **121**, **221**, **321**, **131**, **231**, **331** and/or other suitable components of the head and neck cradle **100**, **200**, **300** may be composed of a rigid material such as a metal, plastic, or wood material.

In some implementations, the pad **150**, **250**, **350** may be composed of a supportive and comforting material for a patient's head, such as a foam material. In some implementations, the foam material may be a closed-cell medium density foam material or any other suitable foam material.

In some implementations, the head and neck cradle **100**, **200**, **300** can have any suitable appearance, such as shown in the figures.

In some implementations, an example method of using the head and neck cradle **100**, **200**, **300**, with respect to the above-described figures, comprises placing the lower platform **130**, **230**, **330** under a hospital bed mattress **10** such that the upper platform **110**, **210**, **310** rests adjacent to the end of the mattress **10** and extends away from the hospital bed, such as shown in FIGS. **3** and **10**A-**10**D.

In some implementations, the height of the middle portion **120**, **220**, **320** is adjusted such that the upper platform **110**, **210**, **310** is below the top of the hospital bed mattress **10**, such as shown in FIGS. **3** and **10**A-**10**D. In some implementations, the height of the middle portion **120**, **220**, **320** may be adjusted such that the upper platform **110**, **210**, **310** is in any other suitable position.

In some implementations, the method may further comprise adjusting the horizontal position of the pad **350** (e.g., the head pad **354** and/or the chin/neck pad **355**), e.g. to better fit and/or support a patient's head, by adjustment of the upper platform **310**.

In some implementations, the method may further comprise placing the pad **150** on top of the upper platform **110** such that the openings **152**, **153** of the pad **150** are aligned respectively with the openings **112**, **113** of the upper platform **110**, such as shown in FIG. **2**E.

In some implementations, the method may further comprise placing the pad **150**, **250**, **350** on top of the upper platform **110**, **210**, **310** such that a patient's face can be positioned and/or rested on the pad **150**, **250**, **350** with the patient's face positioned within the middle opening **112**, **212**, **312** and/or adjacent to the side opening **113**, **213**, **313**.

In some implementations, the method comprises placing a patient in a prone position on the hospital bed mattress **10** with the patient's head placed on the upper platform **110**, **210**, **310**. In some implementations, the patient's head is placed on the pad **150**, **250**, **350** that is positioned on the upper platform **110**, **210**, **310**, such as shown in FIGS. **3** and **10**E-**10**L.

In some implementations, the patient's head is placed on the upper platform **110**, **210**, **310** and/or the pad **150**, **250**, **350** such that a portion of the patient's face can be observed through the opening **112**, **152**, **212**, **312** through the middle of the upper platform **110**, **210**, **310** and the pad **150** respectively, such as shown in FIGS. **3** and **10**E-**10**L. In this way, in some implementations, the patient can be monitored in the prone position with less or no difficulty and the patient can be kept in the prone position while reducing or preventing facial bruising or similar harm.

In some implementations, any tubes (such as for ventilation) and/or other equipment extending from the patient are positioned through the opening **113**, **153**, **213**, **313** through the side of the upper platform **110**, **210**, **310** and the pad **150** respectively. In this way, in some implementations, the patient can be accessed in the prone position for treatment and the patient can be kept in the prone position while reducing or preventing endotracheal tube displacement such as accidental extubation.

In some implementations, the method may further comprise moving the side opening **313** from one side of the upper platform **310** to the other by detaching the upper platform **210** from the middle portion **220**, flipping over the upper platform **210**, and reattaching the upper platform **210** to the middle portion **220**, such as shown in FIGS. **8**A, **8**B, **8**E, and **8**F.

The figures, including photographs and drawings, comprised herewith may represent one or more implementations of the head and neck cradle.

Details shown in the figures, such as dimensions, descriptions, etc., are exemplary, and there may be implementations of other suitable details according to the present disclosure.

Reference throughout this specification to "an embodiment" or "implementation" or words of similar import means that a particular described feature, structure, or characteristic is comprised in at least one embodiment of the present invention. Thus, the phrase "in some implementations" or a phrase of similar import in various places throughout this specification does not necessarily refer to the same embodiment.

Many modifications and other embodiments of the inventions set forth herein will come to mind to one skilled in the art to which these inventions pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings.

The described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments. In the above description, numerous specific details are provided for a thorough understanding of embodiments of the invention. One skilled in the relevant art will recognize, however, that embodiments of the invention can be practiced without one or more of the specific details, or with other methods, components, materials, etc. In other instances, well-known structures, materials, or operations may not be shown or described in detail.

While operations may be depicted in the drawings in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results.

The invention claimed is:

1. An apparatus comprising:
an upper portion;
a lower portion; and
middle portion, wherein:
the upper portion extends lengthwise and widthwise and comprises at least a first flat horizontal surface extending lengthwise, a second flat horizontal surface extending lengthwise, and a side portion extending widthwise between the first flat horizontal surface and the second flat horizontal surface on a first side of the upper portion;
the first flat horizontal surface and the second flat horizontal surface are parallel to each other and separated from each other thereby defining a center opening between the first flat horizontal surface and the second flat horizontal surface, the upper portion further comprising a pad or padding attached to the first flat horizontal surface and a pad or padding attached to the second flat horizontal surface;
the side portion extends widthwise in a direction away from the middle portion;
a second side of the upper portion opposite the first side of the upper portion comprises a side opening accessible to the center opening;
the lower portion comprises at least one portion extending away from the middle portion in a direction opposite the side portion in the upper portion; and
the middle portion extends between the upper portion and the lower portion.

2. The apparatus of claim **1** wherein the length of the middle portion is adjustable such that a distance between the upper portion and the lower portion is adjustable.

3. The apparatus of claim **1** wherein the first flat horizontal surface is moveable along the side portion to adjust a distance between the first flat horizontal surface and the second flat horizontal surface.

4. A system comprising
a ventilator having one or more tubes extending therefrom;
a bed having a mattress; and
the apparatus of claim **1** wherein,
the lower portion of the apparatus of claim **1** is positioned under the mattress such that the upper portion of the apparatus of claim **1** is positioned adjacent to the end of the mattress; and
the one or more tubes extending from the ventilator are positioned through the side opening of the apparatus of claim **1**.

5. A method of using the system of claim **4** comprising:
placing the lower portion of the apparatus under a mattress such that the upper portion of the apparatus rests adjacent the end of the mattress and extends away from the mattress;
placing a person in a prone position and placing a portion of a person's head on the pad or padding such that a portion of the person's face may be observed through the center opening; and
extending at least one tube extending from the person through the side opening of the apparatus to medical equipment.

6. A method of using the apparatus of claim **1** comprising:
placing the lower portion of the apparatus under a mattress such that the upper portion of the apparatus rests adjacent the end of the mattress and extends away from the mattress;
placing a person in a prone position and placing a portion of a person's head on the pad or padding such that a portion of the person's face may be observed through the center opening; and
extending at least one tube extending from the person through the side opening of the apparatus.

7. The method of claim **6** further comprising moving the first flat horizontal surface along the side portion to adjust a distance between the first flat horizontal surface and the second flat horizontal surface.

8. The method of claim **6** further comprising adjusting the height of the middle portion.

9. An apparatus comprising:
an upper portion;
a lower portion; and
middle portion, wherein:
the upper portion extends lengthwise and widthwise and comprises at least a first flat horizontal surface extending lengthwise, a second flat horizontal surface extending lengthwise, and a side portion extending widthwise between the first flat horizontal surface and the second flat horizontal surface on a first side of the upper portion;
the first flat horizontal surface and the second flat horizontal surface are parallel to each other and separated from each other thereby defining a center opening between the first flat horizontal surface and the second flat horizontal surface and wherein the first flat horizontal surface is moveable along the side portion to adjust a distance between the first flat horizontal surface and the second flat horizontal surface, the upper portion further comprising a pad or padding attached to the first flat horizontal surface and a pad or padding attached to the second flat horizontal surface;
the side portion extends widthwise in a direction away from the middle portion;

a second side of the upper portion opposite the first side of the upper portion comprises a side opening accessible to the center opening;

the lower portion comprises at one portion extending away from the middle portion in a direction opposite the side portion in the upper portion; and

the middle portion extends between the upper portion and the lower portion wherein the length of the middle portion is adjustable such that a distance between the upper portion and the lower portion is adjustable.

* * * * *